THE FARMERS' REGISTER.

VOL. III. DECEMBER, 1835. No. 8.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

TREATISE ON IRRIGATION.

Extracted from the Practical Irrigator and Drainer.

By GEORGE STEVENS.

[Concluded from p. 408 Vol. III.]

Although the formation of this meadow has been very expensive, there can be no doubt as to the success, if a regular management be carried on.*

Another water meadow was made the same year at Craighlaw, the property of W. C. Hamilton, Esq., and one near Creetown, for Major Campbell, with a small experimental one at Castlewig, belonging to Hugh Hawthorn, Esq.

The formation of these meadows not being finished till late in the season, the first crop could not be expected to be great; however, there can be no doubt as to their future success, if properly managed.

I have been favored with the following short statement of the success of irrigation in Aberdeenshire, by Mr. John Boulton, land surveyor:—

"The extent of land that has been irrigated under my direction in this county is, viz. for James Ferguson, Esq. of Pitfour, ninety English acres, of all kinds of soils. The land, previous to its being made into water meadow, was valued at from 7s. to 15s. per acre of yearly rent; the expense of cutting feeders and drains, &c. was from £2 to £14 per acre; and the increased value by irrigation has been from £2 10s. to £4 per acre. Since the introduction of the system at Pitfour, I have made many other water meadows, both for tenants and proprietors, which have succeeded equally with the first mentioned."†

Captain Aytoun has had the goodness to favor me with the following interesting account of Miss Rutherford's water meadows at Glendevon, and with a letter from the Rev. John Brown, minister of Glendevon, showing the comparative value of the same kind of land, under a regular rotation of cropping:—

"*Dear Sir*—As you have requested me to give you an account of the produce of Miss Rutherford's water meadows at Glendevon, and an estimate of the return made by them, as well as for the expense of formation, I shall endeavor to do so as well as I can. I must say, however, that if you insert this statement in the new edition of your work, I should like your readers to understand that I do not pretend to any knowledge of agriculture, and that, therefore, it is only the facts which I shall state, relative to the produce and the expense of forming the meadows, which can be entitled to any weight, and that my conclusions from those facts may very possibly be erroneous.

"Miss Rutherford has already formed two meadows, one of which is watered by the Devon, and measures about nine Scotch acres; the other contains two acres, and is watered by a small brook. The large meadow was formed, according to your directions, into beds, forty feet broad, raised about twelve inches in the crown. As the turf of this meadow was too tender to be lifted, the ground was ploughed several times, and then formed by the spade and barrow into bed-work.

"It was sown with grass seeds about the 20th June 1827, and, after being watered during the ensuing winter, produced a crop of three hundred stone an acre of the finest hay, which was lodged in the barn-yard by the 1st of July 1828. The turf of the small meadow was lifted, and, after the ground had been ploughed and levelled for catch-work, was replaced in the usual manner. This meadow also produced about three hundred stone an acre of very fine hay; but as the water was very deficient in the spring, it was not cut so soon as the other. After the hay was removed, the meadows were watered for about a fortnight, with the intermission of a few days at a time, and the grass sprang up with the greatest rapidity. On the 21st July, forty-three sheep and ten cattle were turned into the large meadow. The sheep were ready for the butcher by the 18th of August, and most of them were sold for 4s. 6d. more than they were worth (according to the shepherd's estimate) when they were turned in. From the 18th August the meadow was watered as before, till the 1st of September, when thirty-five sheep were turned in; but as they could not consume the grass, and as I was desirous of preparing in time for the autumnal floods, twenty more were put in on the 10th, and twenty-eight more on the 18th September, in order that the grass might be eaten quite bare, before the feeders should be cleaned out for the winter watering. The sheep were removed on the 1st October; but the waterman, being at that time busy with altering the conductor of the small meadow, watered the large one again, without cleaning out the feeders, &c.; and on the 18th October, sixty-seven sheep were turned into the meadow, in order to consume the grass produced by the last watering as quickly as possible, previous to the winter watering. On the 29th October the sheep were removed to allow the works to be cleaned, although the grass was by

---

* I have made every inquiry to obtain a true statement of the quantity of last year's crop of hay; but the old lease of the farm being out, and the tenant not having got a new one, the hay was mixed (for reasons best known to the tenant) with other hay, by which means all my inquiry has been frustrated.

This being the first water meadow that has been made in the county, it has met with considerable opposition; but the proprietor, being fully determined to give it a fair trial, has appointed an experienced person to look after it through the irrigating season.

†The product of the Aberdeenshire meadows is very deficient, in comparison with what the water meadows produce in other parts of Scotland; which appears to me to be wholly owing to the water being spread over too large a surface—an error too often committed, and which it is very difficult to dissuade proprietors from practising.

Through the course of experience, I have always found that it is more advantageous to irrigate two acres well, than three indifferently.

no means so bare as it ought to be before the winter watering commences. The supply of water for the small meadow was very scanty for the whole summer; but, notwithstanding this disadvantage, it fed forty-three sheep from 21st July till 18th August; and, after being again watered, it kept ten milch cows from 15th September till 20th October.

"The soil of both those meadows is a very light sandy loam, about twelve inches thick, and lying upon a coarse gravel bottom of unknown depth. Glendevon being situated in the midst of the Ochil hills, the climate is severe during the winter, and the spring very late. The meadows are about seven hundred feet above the level of the sea. In such a climate, and at such a height, as far as I can judge, I should say that the ground, well laid down in grass, will give much more produce than it would do if ploughed for corn, &c.

"The rent paid in that part of the country for the best grass parks is £2 an acre, and in the hands of the proprietor it may be supposed to make a sum of about £3.

"However this may be, it is universally allowed by all the farmers in the neighborhood, that Miss Rutherford's meadows will be as valuable in pasture, after the hay is removed, as they were before they were watered. If this is the case, and I think the statement a very fair one, it is evident that, after deducting from the value of the hay the expense of making it and of the waterman's wages, &c., the remainder will show the return made for the capital expended on the improvement.

"The formation of the meadows cost exactly £20 an acre, and the average price of hay about Glendevon being 6d. a stone, the account will stand thus:—

To three hundred stone, at 6d.		£7	10 0
Deduct expense of making hay	£0 10 0		
——— repairing works, &c.	1 0 0		
		1	10 0
Clear produce per acre,		£6	0 0

which, being the return for the outlay of £20, is at the rate of thirty per cent.; and it ought to be observed, that the calculation proceeds upon the supposition that the produce is not to increase as the ground becomes richer and richer, in consequence of continued watering. On the other hand, however, I ought to mention that, although I could not perceive any error in the estimate which I had made of the profits of irrigation, still however I was so much astonished at the apparent result, that I was fearful lest I, like other sanguine projectors, had taken too favorable a view of the improvement, as I was sensible that if any error existed in my calculation, it could only proceed from my estimate of the former value of the ground, before it was formed into water meadows. I requested my friend Mr. Brown, the respected minister of Glendevon, to give me his opinion of the value of his glebe, which is situated close to the meadows, and the soil of which is of precisely the same nature. You will perceive by his letter, which I enclose, that, while he states that the aftergrass of the meadows is as valuable as the pasture formerly was, still he estimates the value of his ground, when under a rotation of crops, at £5 per acre.

"It must, however, be considered, that as Mr. Brown consumes the whole produce of his glebe in his own family, he returns a greater part of the crop to the ground than any farmer, with a moderate single farm, could possibly do, because the farmer must dispose of a very considerable portion of his crop. You will also perceive, that Mr. Brown purchases every year between three hundred and four hundred stone of hay, the whole of which, after being converted into manure, is applied to the arable part of his glebe, which contains only four acres; and that he does not charge any portion of the expense of this hay against the ground, which it appears to me he ought to do, as certainly, if he did not purchase that quantity of hay annually, and apply the manure it produces to the ground, he would not have such crops as he has. But, however this may be, Mr. Brown's estimate of the value of the ground ought to be much more relied on than mine; and I therefore request you will attach it to this statement, by which means your readers will be able to judge for themselves. If they should think with Mr. Brown, that, in that high situation and severe climate, a rotation of crops is more profitable than grazing, they will probably reduce the estimate which I have made of the result of irrigation to twenty per cent.; but if they should agree with me in thinking that grazing is the most profitable husbandry in a country like Glendevon, then I have no doubt that they will also agree with me in saying, that Miss Rutherford's profit upon the capital expended in forming her meadows is not less than thirty per cent. You are well aware of the peculiar difficulties which had to be overcome in forming the conductor for the large meadow; and it was owing to those peculiar difficulties that the expense of forming Miss Rutherford's meadows was so great.

I am, dear Sir,
Your obedient servant,

M. C. W. AYTOUN."

"*Glendevon, 2d Dec.* 1828.

"*My Dear Sir*—Your queries lead into a wide field, and require more experience than I have yet attained to, to answer them all. I shall, therefore, confine myself to that part which relates to the profit which the ground lying on the river side may afford to the cultivator. The soil is of no great depth, and rests on a gravel bottom. I have about four acres of this kind of land included in the glebe, and have managed them in the following manner:—

"After liming the whole, I took a crop of oats, then a green crop, after that a crop of barley sown with grass seeds; this was succeeded by a crop of hay, then oats, &c. as before. The produce from this management, on an average, was nearly as follows:—oats, from seven to eight bolls; potatoes, about sixty bolls, measured by the Linilthgow barley firlot, heaped; barley, six bolls; and hay, about two hundred stone. After deducting the seed, the produce may be stated as follows:—oats, six bolls, at 17s. per boll, £5 2s.; potatoes, fifty-six bolls, at 5s. per boll, £14; barley, five bolls, at 20s. per boll, £5; and hay, two hundred stone, at 6d. per stone, £5—the hay oftener above than below that price, the second cutting paying for the

seed and making the hay. The whole free produce may amount to about £29. Should we allow £7 for the whole annual labor bestowed on the field, there will remain £22. I consider the above as nearly the average of each, and the average prices. The straw goes to make manure. I followed the above plan of culture for nearly thirty years; at this period the red clover failed, and the rest of the crops decreased in quantity, I limed again with Rescobie lime, thirty-six bolls of shells, barley measure, per Scotch acre. This produced a tolerable crop of clover the first year after the lime was laid on, but not equal to what the land produced when first limed. The second time the clover was sown on the land thus prepared, it appeared very thin and feeble in the stem, and, indeed, by the time of cutting the hay, it disappeared almost altogether.

"In this situation, I divided the field into six parts instead of four; by this method, after taking the same crops, I have two years' pasture. With this treatment, the cultivated crops will be improved, and no less will be produced by the pasture. I think four acres will still produce £20 yearly, after paying expenses of management. I would mention, that the green crop has the manure produced by one horse kept constantly in the stable, summer and winter, and two and sometimes three cows. To support these, I add annually to the fodder produced from the four acres, from three to four hundred stone of hay, which I purchase. The land you have laid under water is exactly of the same description, and, under the same management, would produce the same result. The hay produced on your watered field was equal to mine in quality, and exceeded it in quantity by one-half. The proportion yours bore to mine was as three to two, and the aftergrowth in your field was nearly, if not wholly, equal to what it would have produced when under pasture, before it was watered. Your shepherd said that the small field at Whitens produced nearly five times as much this year as it did in its former state; this is, I think, somewhat exaggerated, and it is scarcely a fair representation of it. This field was formerly under the plough, and, after being quite exhausted by tillage, it was left to produce such grass as was natural to the soil and climate. From this treatment, little produce could be expected. Had this little spot been cultivated with ordinary care, it would have produced a very different crop. When I saw C. Stewart, he could not inform me how many sheep the aftergrass would keep, as he had not then got the measurement of the field.

"The above is, I fear, but a lame and unsatisfactory answer to your queries, and conveys little information on the points referred to beyond what you are already in possession of. I rather think that some trial will be necessary before you can ascertain the extent of the improvement, and the benefit arising from it.

"The advantage, so far as yet appears, gives every promise that the plan will succeed, and that the profit arising from it will amply indemnify you for your present outlay. As far as I can judge, I think, by the method you have adopted, you will have the crop of hay beyond what the field formerly produced when under the ordinary system of pasturing; and a crop of hay in this sequestered glen is of more value than in the arable district of the country. Here the portion of arable ground is very limited in extent, and insufficient to answer the demands of the store-farmer: whatever tends to supply this deficiency, confers a very great benefit on the place. Your servant, after he gets the measurement, will be able to give you the remaining information to which your letter refers.

"By comparing the produce from the ordinary method of management with the produce your field yields under your new method, you will be able to ascertain exactly the profit resulting from your experiment.

I ever am,
My dear Sir,
Yours most sincerely,
JOHN BROWN."

Captain Aytoun,
No. 19, Coates Crescent,
Edinburgh.

As to the result of these statements, I leave the reader to judge; but, at the same time, I think it necessary to observe, that the making of the conductor to the large water meadow was attended with great difficulty, the greater part having been obliged to be cut through rock, which added considerably to the expense. By Captain Aytoun's account, three hundred stone of hay per acre is stated as the average crop, which is considerably too little, the water having been put on the meadow before the ground was properly swarded, therefore a much larger crop of hay might be expected when the land is properly replenished with natural plants; also the sum for keeping the works in repair, and superintending the regulating of the water through the watering season, is charged greatly too high, which mistake makes the profits of the water meadows much less than they otherwise would have been; whereas, on the other hand, Mr. Brown's system of cropping is calculated at the very highest rate.

We are told of the water of the Nile being so advantageous in agriculture, and of the watering system used in China and the East Indies for producing large crops of rice and Indian corn; but though we have no Delta to receive our rich streams, nor Indian corn nor rice, we have sandy soils and barren grass lands capable of receiving equal benefit with the lands of those so much boasted of countries, if the proper means were employed.

To elucidate this, we have only to examine the effects produced by the accidental overflowing of the Thames, Severn, Tay, Spey, and Clara river in Sweden,* which will sufficiently prove the above assertion, and show the value of the sys-

*The Clara river has its course in Norway, and, after having run nearly two hundred miles through the province of Wermland in Sweden, falls into the lake Wenern near Carlstad. This river is generally so much swelled by the melting of the snow in spring, that the water often rises fifteen feet in perpendicular height, overflowing all the low lands for many miles, which are mostly composed of fine sand. The greater the inundation is, the more fertilizing substance is left on the surface of the land, which acts as a manure, and produces large crops of oats and barley.

tem, without mentioning the astonishing effects produced by the common sewer water of the city of Edinburgh and other towns; but, were I to omit these interesting improvements, I should, by no means, do justice to the subject.

Immediately below the town of Maybole, in Ayrshire, a considerable extent of grass land, belonging to Quentin Kennedy, Esq., was partially irrigated with the common sewer water of that town, but, owing to the water being imperfectly distributed over the surface, the crops of hay and grass were very irregular. To obviate this defect, the proprietor caused the works to be remodelled under my direction, which, as will be seen from the subjoined letter, has been completely successful.*

Alexander M'Laurin, Esq. of Broich, was the first who collected the common sewer water of Crieff for irrigation. Mr. M'Laurin's meadow is regularly laid into catch-work beds. The soil is very porous, with a gravel sub-soil: the supply of water is very little, which makes the management difficult, the water being obliged to be changed from place to place very often. For the first two or three years, the irrigation did not succeed according to expectation, which made the proprietor think something must be wrong in the management. He therefore took the charge of changing and regulating the water himself, which completely confirmed his opinion that the fault lay altogether in the manager, for he has had no reason to complain ever since. The crops of grass and hay are constantly equal to his most sanguine expectations, being generally from three hundred and fifty to four hundred stone of hay, of the best quality, per acre.

Edinburgh has many advantages over the most of her sister cities; the large supply of excellent spring water is one of the greatest blessings to her numerous inhabitants, both in respect to household purposes and keeping the streets clean, as well as irrigating the extensive meadows situated below the town, by the rich stuff which it carries along in a state of semi-solution, where the art of man, with the common sewer water, has made sand hillocks produce riches far superior to any thing of the kind in the kingdom, or in any other country.

By this water, about two hundred acres of grass land, for the most part laid into catch-work meadow, are irrigated; whereof one hundred and thirty belong to W. H. Miller, Esq. of Craigintinny, and the remainder to the Earls of Haddington and Moray, and other proprietors. The meadows belonging to these noblemen, and part of the Craigintinny meadows, or what is called the old meadows, contain about fifty acres, and have been irrigated for nearly a century. They are by far the most valuable, on account of the long and continual accumulation of the rich sediment left by the water; indeed the water is so very rich, that the tenants of the meadows lying nearest the town have found it advisable to carry the common sewer water through deep ponds, into which the water deposites part of the superfluous manure before it runs over the ground. Although the formation of these meadows is irregular, and the management very imperfect, the effects of the water are astonishing; they produce crops of grass not to be equalled, being cut from four to six times a year, and the grass given green to milch cows.

The grass is let every year by public sale, in small patches of a quarter of an acre and upwards, and generally brings from £24 to £30 per acre per annum. In 1826, part of the Earl of Moray's meadow fetched £57 per acre per annum.

About forty acres of the Craigintinny lands were formed into catch-work water meadow before the year 1800, which comprises what is called Fillieside Bank old meadows, and is generally let at from £20 to £30 per acre per annum. In the spring of 1821, thirty acres of waste land, called the Freegate Whins, and ten acres of poor sandy soil, were levelled and formed into irrigated meadow, at an expense of £1000. The pasture of the Freegate Whins was let, previously to this improvement, for £40 per annum, and the ten acres for £60. They now bring from £15 to £20 per acre per annum, but may be much improved by judiciously laying out £200 more in better levelling that part next the sea, and carrying a larger supply of water to it, which might be easily done without prejudice to the other meadows.

This, perhaps, is one of the most beneficial agricultural improvements ever undertaken; for the whole of the Freegate Whins is composed of nothing but sand, deposited from time to time by the action of the waves of the sea. Never was £1000 more happily spent in agriculture; it not only required a common sewer to bring about this great change, but a resolution in the proprietor to launch out his capital on an experiment upon a soil of such a nature.

Since the making of the Freegate Whins into water meadows, Mr. Miller has levelled and formed forty acres more of his arable land into irrigated meadow, worth, before the formation, £9 per acre per annum. It will only require a few years before these meadows will be as productive as the former; for it is evident that the longer wa-

---

*"*Lochlands, 3rd March*, 1832.

"SIR—It is with great pleasure I report to you the state of the meadow grounds in this quarter, which underwent the operations suggested by you. The convertion of the piece of ground in Bogton, occupied by myself, into water meadow, has completely succeeded, and realized your best expectations. From a piece of rough moss land, which previously yielded not more than fifty stones, it now produces not less than two hundred stones of hay per acre of good quality; and will, I am confident, continue to increase both in quality and productiveness. The other and adjoining portion of meadow has also, by means of the drainage, been greatly improved in the quality as well as the quantity of the grass. Again, as to the piece of ground in the adjacent farm of Dangerland, which was drained by your directions, the improvement in the quantity and the quality of its grass has not been less than on the piece of Bogton above alluded to. And, finally, the old meadows of Tannock and Dangerland, in the immediate neighborhood, the produce of which, previous to the drainage which you directed, was in many parts coarse and husky, now yield grass of a very improved quality. I consider that this last improvement is *also* to be attributed to the regulated mode of putting on and taking off the water prescribed in your instructions. I am confident that the whole improvements on these grounds will amply repay all the expense.

I am, dear Sir,

Yours truly,

JAMES KENNEDY."

ter is suffered to run over the surface of grass land, the greater quantity of fertilizing substance will be collected: therefore as the water is so very superior in quality to all other water, a speedy return for the capital laid out may be expected.

The expense of keeping these meadows in repair is from 10s. to 15s. per acre per annum, which is more than double the expense of keeping water meadows in repair in general, for the watering of them is not only through the winter season, but the water is put on them for one or two days together, immediately after every cutting of the grass, through the whole of the season.

One hundred and ten acres of Mr. Miller's meadows, in 1827, gave a clear profit of £2300.

Such specimens, one should imagine, will carry sufficient weight with them to turn the scale against any objection to the practice of irrigation, arrising from a fear of expense, inferiority of soil, or poorness of water; which have always been the principal charges against the system, and, I am sorry to say, have prevented many proprietors from making the experiment. But it is sufficiently proven, that land of the worst quality, with the poorest water, under good management, in the highest districts of Tweeddale, after deducting the expense of keeping in repair, brings nearly £7 per acre per annum.

In 1828, a water meadow, consisting of nearly thirty acres, was commenced at Bertha, on the north side of the river Almond, for the Right Honorable Lord Lynedoch, and was completed the following year. The soil is partly alluvial, and partly gravel and sand, laid into natural ridges by the action of water. Previous to its being irrigated, the alluvial part produced tolerable good pasture, but the gravel and sand ridges were mostly covered with broom. The inequality of the surface would not permit its being formed into regular beds of either catch or bed-work irrigation; it is, consequently, made into a continued succession of both. It commands the whole of the water of the Almond after the manufactories and town of Perth are supplied, which, in droughty seasons, intercepts the whole; but although so situated, and the water running through a poor country, yet it contains a considerable quantity of enriching substance, whereby the land has already been improved three times its former value, and there is every reason to believe the value will still be increased considerably. Further particulars will be found in the annexed letter from the factor on the estate.*

During the period last mentioned, a catch-work meadow was made for the Honorable Lord Corehouse, consisting of a little more than five acres, partly by means of lifting the turf, levelling and pulverizing the soil, and laying down the turf again; and partly by ploughing and levelling the surface, and sowing it with natural grasses. The water used is of good quality, but rather scarce in droughty seasons. The grass of the meadow is cut twice a year; the first crop being generally made into hay, and the second given green to cattle. The produce of hay this year was nineteen hundred stones.

Another catch-work meadow was made in 1829 and 1830 at Dalquharran, the property of T. F. Kennedy, Esq., M. P. Its extent is about eight acres, of a gravelly sub-soil, and was prepared in the same manner as the last mentioned, at an expense from £4 to £9 per acre. It is formed into four parts, two on each side of the burn which runs through it; the water, after running over the two upper parts, is caught and carried over the two lower, and the whole being so arranged that any portion can be irrigated separately. No expense has been spared to make this meadow as complete a specimen as the nature and situation of the land would admit.

In a letter from the proprietor just received, (Nov. 7th, 1833) he says, the part first irrigated produces three hundred, and the second two hundred stones of hay per acre, worth, in general, 6d. per stone, and the aftergrass is worth 20s. per acre annually, and that he has not the least doubt but that within two years the latter will produce an equal quantity with the first.

Since the publication of the second edition of this work, I have been employed in making many other water meadows in this country, and in

---

*"*Lynedoch*, 29*th Feb.* 1832.

"DEAR SIR—I had intended to send you a short account of Lord Lynedoch's water meadow last week, but several unforeseen occurrences have prevented me from doing so till now.

"The formation of this meadow was completed early in May 1829, and for the eight preceding years it was let for pasture at the average rent of £30 11s. 3d. The total cost of its formation was £320 10s. 7d., and the average annual expense of managing it for the last three years has been £17 17s. 5d.

"It is unnecessary to say any thing of the produce of this meadow in 1829, as those parts where cutting or forcing was necessary to bring it into form, were but imperfectly swarded when the crop was cut, and yielded nothing; but, upon the whole, I reckoned the crop worth double the average rent which the field produced while let for pasture.

"The crop of 1830 was put up in twenty-one ricks, nineteen of which were sold by auction on the 21st of December of that year for £89 16s. 6d. One of these ricks was selected as an average of the whole, and weighed, and from this I estimated the produce of the meadow at three thousand nine hundred stones iron, and the price at which it sold 6d. a stone. We had rather unfavorable weather for making the hay that year and it was not of the best quality. The aftermath was let for pasture, from the 22d August to the 15th October, for £12, so that the total produce of the meadow in 1830 was £109.

"In 1831, from a scarcity of water in the spring and early part of the summer, the crop was, as nearly as I could estimate it, about one-third less than that of the preceding year, or not exceeding two thousand seven hundred stones; but the quality of the hay was so much superior, that in value I do not consider it above one-fifth inferior to crop 1830.

"Our own sheep were turned into the meadow after the crops of 1829 and 1831 were carried, but I kept no account of their number, nor the time they were upon it, in either year.

"I do not think the meadow has yet come to its full bearing; on the contrary, it may reasonably be expected to produce considerably more than it has yet done; but even if it should continue to yield only at the rate it has done for the two last years, it must be held to be a profitable undertaking.

I am, dear Sir,
Yours sincerely,
WILLIAM GOODSMAN."

taking levels and making plans for the irrigation of several hundred acres belonging to different noblemen and gentlemen in Sweden; but from the numerous cases already mentioned, I consider it unnecessary to give any more examples, as from them the reader must be convinced of the great value of these improvements; I shall, therefore, conclude this essay with a short summary of the advantages to be derived from irrigation.

The crops on water meadows are produced at the least expense, and with the greatest certainty of an early return. On water meadows that are well managed, the grass is the earliest and of a superior quality, well adapted for the feeding of ewes and lambs;* and the hay, when properly made, is equal to the best clover hay, and superior to any other kind for milch cows. When the herbage of dry porous soils is impoverished for the want of moisture, and the rich spungy land by its remaining too long stagnant, both of these evils are remedied. Another great advantage attending irrigation, is the extra supply of manure it yields to the arable part of a farm, especially when the lands are lying (which is often the case) at so great a distance, that it is almost impossible to procure it for money.

The success of improving land by irrigation, perfectly warrants an experiment in the most unfavorable situation. The result will invariably triumph over every prejudice.

I will conclude this interesting subject with the following extract from Mr. Walter Blith's Survey of Husbandry Surveyed. London, 1653, 4to. (Page 25.)

"Thou hast also another great advantage hereby having water drawne over thy land, thou art in such a capacity that, in case of drought in time of summer, thou needest not to feare it. Thou mayest now and then wet over thy land in the heat thereof, where grasse, if it have but moysture, will grow far faster in so hot a time than any; but be sure not to soake thy ground too much: keepe thy land rather in a thirsting condition, not glutted ready to spew it up again, so mayest thou preserve thy land greene and fruitfull, when others are scorched all away, then may a weeke's grasse or a load of hay possibly be worth three or four.

"I myselfe, by these opportunities, have cut twenty-four load in a meadow, where I cut but five or six the year before, when hay sold at a great value. The directions exactly followed, I will lose my credit if thou faile of the effect promised."

INDIAN CORN MADE WITHOUT TILLAGE AFTER PLANTING.

To the Editor of the Farmers' Register.

By experiment, I have arrived at some conclusions in regard to the culture of Indian corn, which I think are of importance to planters in the southern states. I communicate them for the use of the public with great hesitation, because they are directly at variance with the received opinions on the subject.

The early part of my life was spent in agricultural pursuits—and hence, if there were no other reason, I feel a deep interest in every thing relating to agriculture. I noticed, very early, the great difficulty in transplanting successfully the young corn plants. Whence comes this, but from breaking the roots in taking the plant up? How is it then, that intelligent planters affirm the doctrine, that one chief object of ploughing corn, is to cut its roots? If breaking the roots of young corn in transplanting it, is really fatal to its future growth, must not breaking its roots with the plough, when it is older, and the season hotter, be a serious injury to it? Any other conclusion seems to me to be at variance with the general economy of nature. It seems to me that there can be, in truth, but two reasons for ploughing or hoeing corn—1st, to destroy grass and weeds—and 2nd, to keep the soil loose, that the roots may penetrate easily, in search of their proper food. But in accomplishing these two purposes, great injury must be done to the corn, by breaking its roots. Can we not accomplish both these ends, and at the same time keep clear of the attendant mischief? I think we can.

Last spring I planted a small piece of poor ground—first breaking it up well. The rows were made three feet apart, and the stalks left about a foot apart in the drill. The ground had been very foul last year with crab grass, whose seed matured. The corn was not well up this spring before the grass began to appear. When the corn had about four or five blades, the young grass completely covered the ground, and the corn was turning yellow. I spread a small quantity of stable manure around the corn, and covered the whole ground three or four inches deep with leaves from the forest, taking care to do this when the ground was wet, and the leaves also, that they might not be blown away, and to leave the tops of the young corn uncovered. In *ten days* there was not a particle of *living* grass to be found, and the corn had put on that deep blueish green, which always betokens a healthful condition of the plant.

From the day the corn was planted until after the fodder was pulled and the tops cut, nothing more was done with it, and the result is a product at the rate of *forty-two* bushels to the acre—about one-third of the stalks having two ears on each of them.

I noted, in the course of the summer, the following facts:—

1st. The corn treated thus, was always ahead of some planted along-side of it, and treated in the usual way.

2nd. It ripened at least ten days sooner than other corn, planted at the same time.

3d. During the hottest and dryest days the blades never twisted up, as did other corn in the neighborhood.

4th. In the dryest weather, on removing the leaves, the ground was found to be moist to the surface, and loose, as deep as it had been at first broken up.

5th. The heaviest rains had scarcely any effect in washing away the soil, or making it hard.

It certainly will require less labor to produce corn

---

* If the late Sir George Montgomery, Bart. of Magbiehill, had not had recourse to his water meadows in the cold backward spring of 1826, his numerous flocks would undoubtedly have starved; but by putting them on the water meadows from the middle of April to the first of May, he not only preserved the most of his lambs from perishing, but, in the same year, cut nearly three hundred stone of hay per acre.

in this way, than in the usual mode. And even if it required more, we have the consolation to know, that while, by the old mode, every hour's work is an injury to the land, by this mode, every hour's work is making the land better; for few things can be better manure than the coating of leaves put on in summer, when ploughed in the winter or spring following.

I used leaves raked up in the forest, because of these there is an ample supply within the reach of almost every person—and because there seems, from my observation, to be a strong antipathy between dead and decaying forest leaves, and crab grass, that most harassing foe of agriculturists.

I make this communication, as I have already said, with hesitation, because the idea of raising corn without ploughing and hoeing, and at the same time improving the land, by protecting it against the influence of a scorching sun and washing rains, is so directly in the teeth of the universal practice for ages. The thing is, however, at least, worthy of further trial. It *may* lead to most important results. Those who think the plan worth any attention, may easily make an experiment with an acre or two, and note carefully its progress through the summer. If they are satisfied, after the trial, that there is any thing in it, to extend the operation will not be a difficult matter.

If, on experiment, it should be found advisable to extend the operation, the proper way would be, I think, to collect the leaves in winter, and deposite them in heaps on the ground on which they are to be used, and the next spring, during a wet season, after the corn is up, spread them, taking care to leave the tops of the young corn uncovered.

There is one very important result that must follow the success of this plan on a large scale—and it was with an eye chiefly to that result, that my experiment was undertaken. The constant excuse for not improving our land, is, that where cotton is grown, the time necessary, first to cultivate the growing crop properly—next to gather it, and then to prepare for a new crop, leaves the planter no time to collect manure. My plan will put an end to that excuse at once; for wherever leaves are to be had, half the time usually bestowed on working the corn crop in the usual way, spent in gathering leaves and putting them on the ground, instead of ploughing it, *may* in a short time, accomplish every thing that can be desired in the way of manuring.

Why may not the same process answer in the cultivation of cotton? If it keeps the ground soft and moist, and prevents the growth of grass and weeds in a corn crop, it will surely have the same effect with cotton—and be the means, further, of preserving the cotton, when the bolls open, from all the injury it sustains from the soil in wet seasons.

This is, however, but speculation. Let it be tested by actual experiment.

JAMES CAMAK.

Athens, Ga. Oct., 10, 1835.

For the Farmers' Register.

"FENCE LESS" AND THE EDITOR OF THE REGISTER,

Have each mistaken the import of our remarks with regard to the law of enclosures. We shall therefore with the permission of these gentlemen, endeavor to make ourselves better understood. When we asserted [p. 47, Vol. III.] that agricultural reform called for no legislative enactment, we had some reason to feel assured that the tenor of our remarks would have exempted us from the charge of maintaining the good policy of the law. And the editor will recollect that the caption to the article we offered, was his own. The one proposed was simply, "remarks upon the existing law of enclosures," or something equivalent.

We distinctly admitted the necessity of agricultural reform, when we pointed out what we considered the most approved method of stock management. The connexion of this subject with profitable husbandry, is so well understood, that we deemed it unnecessary to offer any argument to prove it. And we were not a little surprised that the editor should deny he was called upon to discuss this particular question: particularly after the publication of an article from an English agricultural paper, from which we make the following extract: "Agriculture is divided into three great branches, *green cropping*, *white cropping*, and *stock management;* and they are mutually and severally dependent for success on each other. Without green cropping we cannot raise heavy crops of grain, and without great crops of grain, and consequently of straw, to be used as litter, and partly as fodder in conjunction with the green food for feeding stock through the winter months, we cannot make dung, and without plenty of dung we cannot raise green crops, and so on. And it is such a disposition of stock and crop as shall cause the one to be instrumental in promoting the prosperity of the other. A reciprocity of services, as it were, which ultimately converge to the general advancement of the whole, which in agriculture, constitutes a system, which system must be rigidly adhered to if any thing like *profit* is to be looked for in farming." (*F. R. Vol. I. p.* 674.)

There are two ways of effecting agricultural reform—the one by legislation—and the other by individual enterprise. We are opposed to the legislature's interfering with this subject, for the following reasons. The present system of agriculture in Virginia, although as bad as it well can be, has become, by long usage, identified with the very constitution of society. This system is based upon the legal policy of enclosures—and whenever this law is repealed, the whole superstructure must tumble, and involve thousands in pecuniary distress. We know that this consequence will be denied. But we defy gentlemen to point out a single instance where force has been used to divert the labor of a nation from one channel into another without producing great pecuniary sacrifices. It is difficult in this particular case to point out the precise manner in which the loss would be sustained, because the nature and amount of this loss would depend very much upon the peculiar circumstances of the individual. But innumerable instances might be found in every part of the state in which injury would unquestionably be sustained by repealing the law. According to this view of the subject, we are limited to a choice of evils. On the one hand, the law of enclosures is unjust in principle, and oppressive in its operation. On the other, its repeal would be attended, necessarily, with great pecuniary sacrifices. In our opinion, this difficulty may be avoided by leav-

ing the subject wholly to individual enterprise. We pointed out upon a former occasion, the manner of effecting the desired change. And we referred to instances where it was effected with signal success, both in this state and in different parts of the union.

It seems that the editor admits the policy of adopting the system of separate enclosures at certain periods in the history of agriculture, viz: when the country is just emerging from a *forest state*, and when it has arrived at the *highest state of improvement*. With regard to the intermediate space, he remarks: "But to arrive at this *perfect condition*, embracing enclosures of every field, it is necessary that the durable materials for fencing should be sufficiently cheap—that the land marks on which to build walls, or plant live hedges, should not be changed in every generation, or oftener—and above all, that the profits derived from grazing should be sufficient to compensate amply the additional expense of enclosures. None of these circumstances exist in our naked and poor country—and the whole rent of the country, taking rich and poor land together, would not pay for keeping it enclosed in 20 *acre lots*, as may be good policy in England, and even in some parts of the northern states."—(*Farm. Reg. Vol. III. p.* 50,) From feelings of courtesy towards us, and an evident disposition to leave the discussion of the subject to others, the editor has declined going into the *general question*. But he has nevertheless thought proper to settle the whole subject in a manner more remarkable for its brevity than its accuracy. We never maintained that *rock walls*, *live hedges*, or 20 *acre lots*, were necessary to the proposed scheme of agricultural reform. They were merely referred to in order to illustrate our views of the subject. In the cases particularly cited as being worthy of imitation, the common perishable worm fence of the country was used. And the size of the separate enclosures was regulated according to the convenience of the individual. The editor certainly could not suppose that we recommended the construction of 20 acre lots upon an estate consisting of 500 acres of arable land? The profits of such an arrangement could under no possible circumstances, justify its adoption. Upon an estate of this size these small lots would not only be unnecessary for stock management, but would interfere very seriously with the other operations of the farm. The number of lots should be regulated principally by the rotation of crops. For instance, the four, five, or six-field systemought to have at least the same number of separate enclosures. With this arrangement, these separate fields can be gleaned or grazed, according to circumstances. As to the perishable nature of the fencing material, we could very properly remark, "sufficient for the day is the evil thereof." Why indeed should we trouble ourselves about the substitute until the period arrives when we shall be compelled to adopt it? Dead fences are certainly the best as long as they are the cheapest—and moreover, being easily moved from one place to another, are peculiarly suited to our law of descents, which is constantly changing our land marks. Perhaps the editor will object to the cases referred to, as coming under the specified exceptions. If so, he must exempt one-half of the estates in Virginia. But Mr. Craven expressly states that when he took possession of the premises in question, the soil was reduced to a state of great exhaustion by the very system which has impoverished other portions of the state. Yet this gentleman has found the ways and means of adopting, with success, the system of separate enclosures upon the whole of this arable surface. We are but little acquainted with the general condition of the arable lands in other parts of the state, but with regard to those of Prince George, we have the following description, (we presume from the pen of the editor:) "Much land is planted in corn which does not produce more than one barrel of corn per acre; and about one-half of the arable land of the county falls short of two and a half barrels, which has been stated as the least product that will defray the expense of cultivation. *One-half of our land is not only cultivated without profit, but with certain and increasing loss*—and to this purpose our labor is devoted ninety days, the whole crop being supposed to require six months. Every consideration of profit demands that this portion of our soil should not be cultivated in its present condition." (*Farm. Reg. Vol. I. p.* 234.) Yet the editor makes us embrace in our remarks, the whole of this unprofitable surface: and what is still worse, we are made to build rock walls, rear live hedges, and construct 20 acre lots, upon lands which do not pay the simple labor of cultivation. Our remarks were never intended to apply to soils so hopelessly impoverished, and we shall dismiss them with the remark, that the sooner they are abandoned the better. But to the owners of the small, but really valuable portion of the county, we point them to the neighboring forest, and entreat them to make separate enclosures, and rear the artificial grasses. This system has led to wealth under circumstances not at all more favorable, and will do it again with the use of capital and enterprise. In the words of the above report, "a farm which would yield a regular annual profit of $600 after paying all the expense of cultivation, would be thought cheap at $10,000. But certainly it would be equally profitable to lay out 10,000 dollars on the improvement of land already in possession, if from that improvement, an additional clear profit of 600 dollars could be derived." Now we venture to affirm, that half of this sum applied in the manner recommended, would yield an additional income from stock alone, independent of their immense value as agents in fertilizing the soil.

We assert in the very face of the experiments with which we have been favored by "Fence less," that the proprietors of landed estates in Virginia, cannot afford to raise the stock necessary for domestic uses, in pens and small enclosures. We admit that where a few pigs only are sufficient for an entire family, as in New England, they may be cheaply raised upon the otherwise useless offal of the farm. But when the numerous mouths of a Virginia estate are to be filled, it is altogether a different affair. A different system of stock management must be adopted, or the proprietor will be ruined in his attempts to imitate practices unsuited to the condition of the country. The New England farmer derives no small portion of his profits from his stock, and he is therefore amply remunerated for the additional labor and expense he bestows upon the subject. On the other hand, we are tillage farmers principally in Virginia, and the most we ought to expect is a simple supply for

domestic uses. Even with this difference in the circumstances of the two cases, this system we recommend as best for Virginia, is adopted, on account of its greater cheapness, by some of the very best northern farmers. This system must combine judicious grazing, in which stock become, in part, their own caterers. What becomes of the hundreds of bushels of small grain unavoidably left upon the harvest fields? Of the aftermath of the meadows? Of grazing lots at those periods when they cannot be mowed, and when they receive little or no injury from the hoof? Yet these are some few of the advantages to be wilfully relinquished for a system of management yet untried, and every way more expensive and laborious than the one proposed. "Fence less" tells us that he fed his ox in an old barn from the 1st of December until the March following—but does not inform us what becomes of him after this period. We conclude, however, in the absence of better proof, that he was introduced to the salting tub. The experiment of the cows is remarkable for the same omission—and we are left equally in the dark whether he made beef of them, or turned them to grass. The inference is fair, however, that he adopted the latter alternative. The third experiment of the ten shoats is changed to the summer months, for reasons sufficiently explained by the *clover hay* and the *morceau* of corn. These experiments would be very *stubborn* indeed, but for the omissions of a few very important months. "*Hiatus maxime deflendus.*" Now we ourselves once made an experiment of this sort upon several dozen shoats, commenced very honestly the last of October, and continued until we were threatened with famine. They were then turned out with the solemn injunction to root or die. We should have been obliged to "Fence less" if he had extended his experiments to his entire stock for one whole year, and had then presented us with the results—the state of the corn crib, &c. These he must admit are indispensable considerations in settling a matter of so much importance to the interests of agriculture. It is indeed to be lamented, that those who oppose the policy of the law of enclosures, have failed to point out exactly the method of management they propose to substitute in its stead. The injustice of the law is constantly deprecated: yet the planter or farmer is left at a loss to know what is to become of his stock. It is true we are favored with an occasional experiment or so—but even when fairly carried out for the whole year, they are unsatisfactory and inconclusive, because confined to too small a portion of the stock necessary for domestic uses.

As we have been particularly referred to a writer who signs himself "*Suum Cuique*" as proper authority on this subject, we will take the liberty of adverting, for a moment, to the plan he proposes to substitute in the place of the system imposed upon us by the law of enclosures.

"Each farmer having to maintain his own cattle would keep a smaller number, and confine them generally to a permanent pasture, well enclosed: and being necessarily reduced to *one-fourth of their present numbers*, and treated as well as the change of the system would permit, the live-stock would yield more products of every kind (except hides perhaps) than at present. The lands kept for tillage, *thrice as extensive as the enclosed pastures*, if too poor to be grazed might be safely left without a fence, until their improvement in after time may make enclosures necessary for the owners' interest." (Farm. Reg. Vol. I. p. 398.) Admitting that the fourth part of a farmer's stock would yield more products than the whole, under existing circumstances, (which by the by we don't believe) yet he is still left without the assurance that these diminished numbers will afford a competent supply. It is unquestionably the true policy of the people of Virginia to relieve themselves from the heavy tax they are compelled to pay annually for western meat. No plan of reform is worthy of a moment's consideration which does not profess to meet the whole difficulty. When the defect is radical it must be encountered with a remedy which goes to the very root of the disease. The proposed plan of reform, if not avowedly partial, leaves the subject in doubt and uncertainty, even if we are sure of the anticipated results. But so far from gaining any thing by the plan of "*Suum Cuique*," we are firmly persuaded we should be losers by it. Let us see. One-third of the arable land of the country is enclosed for standing pasture—the remainder is appropriated to tillage. It would be difficult to state the exact amount of stock necessary for the use of any particular estate. But we can venture to affirm, that the live-stock necessary for the consumption of Virginia estates generally, would leave the portion devoted to standing pasture in a situation as destitute of vegetation, as the ordinary unenclosed commons of the country. If this be the case then, the farmer is left in a worse situation than before. He is deprived of one-third of his arable lands, for an advantage which the naked commons afford him, even if they are as destitute of vegetation as the summit of the Alps. His stock must be grain fed in both cases; but the proposed scheme deprives him of one-third of his means for feeding them. The farmers and planters of Virginia are sensible of this difficulty, and for this reason are but little disposed to favor the repeal of the law of enclosures. It is true they are saved the expense of fencing in two-thirds of their arable lands; but, on the other hand, they know that they must lose the profits of one-third of their estates, upon the standing pasture system. The choice of the two evils is too obvious to admit of a moment's deliberation. We will add, moreover, that so far from increasing the products of live-stock by diminishing their number, as "*Suum Cuique*" affirms, the proposed scheme, by diminishing the means of subsistence, would necessarily reduce their numbers, without improving their value. For instance, if an estate of 300 acres arable land will support 30 hogs in a certain condition, one of 200 acres will keep only 20 in the same condition. Here then we have a scheme if carried into practice, would deprive the people of Virginia of three-fourths of their stock and one-third of their arable lands, and leave them in a situation infinitely worse than before.

With regard to the effect of the law of enclosures upon the small farmers, the editor remarks, "The law is perpetually operating to starve out, deprive of their little freeholds, and to banish from Virginia, the valuable class of small farmers, whom it is averred, the system protects." That the law of enclosures imposes a great deal of unprofitable labor, under existing circumstances, we

ing the subject wholly to individual enterprise. We pointed out upon a former occasion, the manner of effecting the desired change. And we referred to instances where it was effected with signal success, both in this state and in different parts of the union.

It seems that the editor admits the policy of adopting the system of separate enclosures at certain periods in the history of agriculture, viz: when the country is just emerging from a *forest state*, and when it has arrived at the *highest state of improvement*. With regard to the intermediate space, he remarks: "But to arrive at this *perfect condition*, embracing enclosures of every field, it is necessary that the durable materials for fencing should be sufficiently cheap—that the land marks on which to build walls, or plant live hedges, should not be changed in every generation, or oftener—and above all, that the profits derived from grazing should be sufficient to compensate amply the additional expense of enclosures. None of these circumstances exist in our naked and poor country—and the whole rent of the country, taking rich and poor land together, would not pay for keeping it enclosed in 20 *acre lots*, as may be good policy in England, and even in some parts of the northern states."—(*Farm. Reg. Vol. III. p.* 50,) From feelings of courtesy towards us, and an evident disposition to leave the discussion of the subject to others, the editor has declined going into the *general question*. But he has nevertheless thought proper to settle the whole subject in a manner more remarkable for its brevity than its accuracy. We never maintained that *rock walls*, *live hedges*, or 20 *acre lots*, were necessary to the proposed scheme of agricultural reform. They were merely referred to in order to illustrate our views of the subject. In the cases particularly cited as being worthy of imitation, the common perishable worm fence of the country was used. And the size of the separate enclosures was regulated according to the convenience of the individual. The editor certainly could not suppose that we recommended the construction of 20 acre lots upon an estate consisting of 500 acres of arable land? The profits of such an arrangement could under no possible circumstances, justify its adoption. Upon an estate of this size these small lots would not only be unnecessary for stock management, but would interfere very seriously with the other operations of the farm. The number of lots should be regulated principally by the rotation of crops. For instance, the four, five, or six-field system ought to have at least the same number of separate enclosures. With this arrangement, these separate fields can be gleaned or grazed, according to circumstances. As to the perishable nature of the fencing material, we could very properly remark, "sufficient for the day is the evil thereof." Why indeed should we trouble ourselves about the substitute until the period arrives when we shall be compelled to adopt it? Dead fences are certainly the best as long as they are the cheapest—and moreover, being easily moved from one place to another, are peculiarly suited to our law of descents, which is constantly changing our land marks. Perhaps the editor will object to the cases referred to, as coming under the specified exceptions. If so, he must exempt one-half of the estates in Virginia. But Mr. Craven expressly states that when he took possession of the premises in question, the soil was reduced to a state of great exhaustion by the very system which has impoverished other portions of the state. Yet this gentleman has found the ways and means of adopting, with success, the system of separate enclosures upon the whole of this arable surface. We are but little acquainted with the general condition of the arable lands in other parts of the state, but with regard to those of Prince George, we have the following description, (we presume from the pen of the editor:) "Much land is planted in corn which does not produce more than one barrel of corn per acre; and about one-half of the arable land of the county falls short of two and a half barrels, which has been stated as the least product that will defray the expense of cultivation. *One-half of our land is not only cultivated without profit, but with certain and increasing loss*—and to this purpose our labor is devoted ninety days, the whole crop being supposed to require six months. Every consideration of profit demands that this portion of our soil should not be cultivated in its present condition." (*Farm. Reg. Vol. I. p.* 234.) Yet the editor makes us embrace in our remarks, the whole of this unprofitable surface: and what is still worse, we are made to build rock walls, rear live hedges, and construct 20 acre lots, upon lands which do not pay the simple labor of cultivation. Our remarks were never intended to apply to soils so hopelessly impoverished, and we shall dismiss them with the remark, that the sooner they are abandoned the better. But to the owners of the small, but really valuable portion of the county, we point them to the neighboring forest, and entreat them to make separate enclosures, and rear the artificial grasses. This system has led to wealth under circumstances not at all more favorable, and will do it again with the use of capital and enterprise. In the words of the above report, "a farm which would yield a regular annual profit of $600 after paying all the expense of cultivation, would be thought cheap at $10,000. But certainly it would be equally profitable to lay out 10,000 dollars on the improvement of land already in possession, if from that improvement, an additional clear profit of 600 dollars could be derived." Now we venture to affirm, that half of this sum applied in the manner recommended, would yield an additional income from stock alone, independent of their immense value as agents in fertilizing the soil.

We assert in the very face of the experiments with which we have been favored by "Fence less," that the proprietors of landed estates in Virginia, cannot afford to raise the stock necessary for domestic uses, in pens and small enclosures. We admit that where a few pigs only are sufficient for an entire family, as in New England, they may be cheaply raised upon the otherwise useless offal of the farm. But when the numerous mouths of a Virginia estate are to be filled, it is altogether a different affair. A different system of stock management must be adopted, or the proprietor will be ruined in his attempts to imitate practices unsuited to the condition of the country. The New England farmer derives no small portion of his profits from his stock, and he is therefore amply remunerated for the additional labor and expense he bestows upon the subject. On the other hand, we are tillage farmers principally in Virginia, and the most we ought to expect is a simple supply for

domestic uses. Even with this difference in the circumstances of the two cases, this system we recommend as best for Virginia, is adopted, on account of its greater cheapness, by some of the very best northern farmers. This system must combine judicious grazing, in which stock become, in part, their own caterers. What becomes of the hundreds of bushels of small grain unavoidably left upon the harvest fields? Of the aftermath of the meadows? Of grazing lots at those periods when they cannot be mowed, and when they receive little or no injury from the hoof? Yet these are some few of the advantages to be wilfully relinquished for a system of management yet untried, and every way more expensive and laborious than the one proposed. "Fence less" tells us that he fed his ox in an old barn from the 1st of December until the March following—but does not inform us what becomes of him after this period. We conclude, however, in the absence of better proof, that he was introduced to the salting tub. The experiment of the cows is remarkable for the same omission—and we are left equally in the dark whether he made beef of them, or turned them to grass. The inference is fair, however, that he adopted the latter alternative. The third experiment of the ten shoats is changed to the summer months, for reasons sufficiently explained by the *clover hay* and the *morceau* of corn. These experiments would be very *stubborn* indeed, but for the omissions of a few very important months. "*Hiatus maxime deflendus.*" Now we ourselves once made an experiment of this sort upon several dozen shoats, commenced very honestly the last of October, and continued until we were threatened with famine. They were then turned out with the solemn injunction to root or die. We should have been obliged to "Fence less" if he had extended his experiments to his entire stock for one whole year, and had then presented us with the results—the state of the corn crib, &c. These he must admit are indispensable considerations in settling a matter of so much importance to the interests of agriculture. It is indeed to be lamented, that those who oppose the policy of the law of enclosures, have failed to point out exactly the method of management they propose to substitute in its stead. The injustice of the law is constantly deprecated: yet the planter or farmer is left at a loss to know what is to become of his stock. It is true we are favored with an occasional experiment or so—but even when fairly carried out for the whole year, they are unsatisfactory and inconclusive, because confined to too small a portion of the stock necessary for domestic uses.

As we have been particularly referred to a writer who signs himself "*Suum Cuique*" as proper authority on this subject, we will take the liberty of adverting, for a moment, to the plan he proposes to substitute in the place of the system imposed upon us by the law of enclosures.

"Each farmer having to maintain his own cattle would keep a smaller number, and confine them generally to a permanent pasture, well enclosed: and being necessarily reduced to *one-fourth of their present numbers*, and treated as well as the change of the system would permit, the live-stock would yield more products of every kind (except hides perhaps) than at present. The lands kept for tillage, *thrice as extensive as the enclosed pastures*, if too poor to be grazed might be safely left without a fence, until their improvement in after time may make enclosures necessary for the owners' interest." (Farm. Reg. Vol. I. p. 398.) Admitting that the fourth part of a farmer's stock would yield more products than the whole, under existing circumstances, (which by the by we don't believe) yet he is still left without the assurance that these diminished numbers will afford a competent supply. It is unquestionably the true policy of the people of Virginia to relieve themselves from the heavy tax they are compelled to pay annually for western meat. No plan of reform is worthy of a moment's consideration which does not profess to meet the whole difficulty. When the defect is radical it must be encountered with a remedy which goes to the very root of the disease. The proposed plan of reform, if not avowedly partial, leaves the subject in doubt and uncertainty, even if we are sure of the anticipated results. But so far from gaining any thing by the plan of "*Suum Cuique*," we are firmly persuaded we should be losers by it. Let us see. One-third of the arable land of the country is enclosed for standing pasture—the remainder is appropriated to tillage. It would be difficult to state the exact amount of stock necessary for the use of any particular estate. But we can venture to affirm, that the live-stock necessary for the consumption of Virginia estates generally, would leave the portion devoted to standing pasture in a situation as destitute of vegetation, as the ordinary unenclosed commons of the country. If this be the case then, the farmer is left in a worse situation than before. He is deprived of one-third of his arable lands, for an advantage which the naked commons afford him, even if they are as destitute of vegetation as the summit of the Alps. His stock must be grain fed in both cases; but the proposed scheme deprives him of one-third of his means for feeding them. The farmers and planters of Virginia are sensible of this difficulty, and for this reason are but little disposed to favor the repeal of the law of enclosures. It is true they are saved the expense of fencing in two-thirds of their arable lands; but, on the other hand, they know that they must lose the profits of one-third of their estates, upon the standing pasture system. The choice of the two evils is too obvious to admit of a moment's deliberation. We will add, moreover, that so far from increasing the products of live-stock by diminishing their number, as "*Suum Cuique*" affirms, the proposed scheme, by diminishing the means of subsistence, would necessarily reduce their numbers, without improving their value. For instance, if an estate of 300 acres arable land will support 30 hogs in a certain condition, one of 200 acres will keep only 20 in the same condition. Here then we have a scheme if carried into practice, would deprive the people of Virginia of three-fourths of their stock and one-third of their arable lands, and leave them in a situation infinitely worse than before.

With regard to the effect of the law of enclosures upon the small farmers, the editor remarks, "The law is perpetually operating to starve out, deprive of their little freeholds, and to banish from Virginia, the valuable class of small farmers, whom it is averred, the system protects." That the law of enclosures imposes a great deal of unprofitable labor, under existing circumstances, we

never denied, and it doubtless accelerates the tide of emigration, constantly carrying off so large a portion of this class of our citizens. But the true moving source of the evil, if an evil it be, exists in the peculiar circumstances of the country, and the same result would have happened though protracted perhaps to a later period, independent of any influence from the operation of the law of enclosures. This cause is to be found in the circumstance, that wherever land is cheap and labor dear, individual interest dictates the adoption of that hard and destructive system of cultivation which so very generally prevails in all new countries, particularly where the products of agriculture have borne enormous premiums. The first victims of this self-imposed, but land destroying system, are the proprietors of ordinary lands. As you advance in the grade of fertility, the tide of emigration is slower—but the cause is still operating until you arrive at soils whose recuperative energies defy the most pernicious agricultural practices. Another assisting cause is to be found in the law of descents. This law is constantly reducing estates to a size which forbids a fair remuneration for agricultural employment. This effect is most sensibly felt in tracts of inferior fertility; because soils of this description offer no inducement for re-uniting these scattered and valueless fragments. For this reason, the great proportion of small farmers are found upon worn and exhausted lands. But wherever lands present a fair prospect for remunerating labor, we find estates assuming a size in spite of these adverse circumstances, which fully justify schemes of profitable husbandry. We refer, for instance, to our alluvion lands and to those belts of extraordinary fertile highland to be found in every part of the state. These remarks are not made, to justify the policy of the law of enclosures, but to show that our agricultural evils are mainly attributable to far other causes than the one specified. The law itself is a mere accessary, the necessary result of our peculiar circumstances—and its repeal would have the effect of hastening the very catastrophe which is so much deprecated by its adversaries. Under the influence of these considerations, we cannot consent to the adoption of any legal measure which will add to the evils of a system which is already dragging its disciples to a point, when it must be finally abandoned.

It is farther objected to the law, that it has a tendency to "amalgamate the small freeholds, and bring them under one fence and one owner."

Whatever his correspondent may think on the subject, the editor will certainly agree with me, that the circumstance complained of, is any thing but an evil. As far as the small farmer is concerned, he is a gainer by it; for he is exchanging unprofitable for profitable labor. As far as agriculture is concerned, the larger the tract in possession of a single individual in a poor and exhausted country, the better. The whole will then have a fairer chance of feeling the beneficial effects of a milder husbandry. Thus have the evils of our agricultural system a tendency to correct themselves, without the intervention of legal assistance, and to bring about those very advantages, which in England have been produced by a singular but very fortunate combination of circumstances.

FENCEMORE.

[Though the foregoing argument is addressed principally to the editor, we shall not trouble our readers with a reply—which indeed, if attempted, would necessarily be drawn from the same materials that have been already used in various parts of this journal. We shall be content with remarking on a single passage of the last paragraph, which shows, on the part of the writer, a misapprehension of our views.

Our correspondent is greatly mistaken in supposing that we agree with him in considering an amalgamation of small farms, forced in the manner stated, as "any thing but an evil." Both large and small farms have peculiar and important advantages, as well as disadvantages, and it is essential to the improvement and profit of agriculture, and to the interest of the people, that there should be farms of both classes—and of every size, except such as are either too large or too small to yield, under suitable and proper management, fair profits. But the great evil is, the frequent change of landmarks—the converting large farms to small, and small to large—the very thing which our correspondent welcomes as a boon bestowed by the operation of the law of enclosures. "Fencemore" had just stated, (and very correctly,) that the tide of emigration from Virginia is swelled by the law of descents, which "is constantly reducing estates to a size which *forbids a fair remuneration for agrciultural employment.*" Then comes the alleged benefit of the law of enclosures, which by making it impossible for the owners to fence and till their little freeholds, compels them to be sold, to be united in some newly formed and newly arranged large farm. Both the changes are necessarily attended with prodigious losses, to the land owners and to the public—and the losses are such as can never be repaired. The small shares of a farm, divided among the heirs of the former owner, are necessarily in most cases of much less value than when united. The purchaser who unites various such shares of several ancient properties, certainly places them in a better situation for profitable culture—but even this object cannot be reached except by additional and great waste of labor and of capital, which would have been unnecessary but for the change of owners and of landmarks. The life of one farmer is spent in fixing an estate in the best form for one property—as a single well managed farm. He dies, and all the loss is sustained by his heirs and the country at large, which necessarily attends the cutting up of this large and well arranged farm into four or five pieces, neither of which is worth holding separately. One child is impoverished by having all the houses, and of course very little land—all the others are houseless. One or more have nothing but forest—others not a tree for fencing. They may possibly spend another generation in struggling under these evils, and in undoing all their father's arrangements. But soon or late, (with that aid of the law of enclosures which "Fencemore" considers in this respect so beneficial,) these reduced properties are, one after another, drawn into the adjacent large farms, and again all the arrangements of the last owners are useless, and are lost to them in the price, to the purchaser, and to the commonwealth. To continually *do and then undo*, is the operation of our governmental land policy—and whatever may be its benefits, they are pur-

chased at an enormous sacrafice of the profits and capital of agriculture.

The agricultural prosperity of a country would be greatly promoted, if the dividing landmarks of farms could never be changed, except by sale or gift, both parties *being alive* at the time, and consenting to the transaction—when it may be supposed that the change would be advantageous to the individuals concerned, and consequently, to the public interest. But changes forced by the operation of law, whether they be in dividing a single farm, or consolidating the parts of the separated shares of several, must always be injurious to both private and public interests. We speak not of the political, moral, or social benefits of the divisions of farms, as caused by the law of descents. Let others make the most of these benefits, concerning which it is not our business to treat. But as they affect the interest and improvement of agriculture—as obstructions to reaping the full amount of product which the entire surface of the country would yield to labor judiciously directed—we regard the continual division of farms under that law, together with the consequent consolidations of various disjointed and unsuitable fragments to form large farms, caused by sales forced by the law of enclosures, as a combination of inflictions on agriculture which yield only in magnitude to the present exhausting drain, or rather flood, of emigration to the west.]

From the *Code of Agriculture* of the 5th edition, 1832.

ON THE RUST* OR MILDEW.

It is proposed to discuss this important subject under the following general heads, 1. The nature and appearance of the rust or mildew; 2. Its causes; and, 3. An account of such remedies as have been suggested, either to diminish, or to extirpate the disease.

1. *The nature and appearance of the rust.*—This disease usually appears in wheat, in the month of June, after the plants have grown to their full length, and before their seeds have ripened. Its first appearance is on the leaves and stems of the plants, in the shape of spots of a dirty white color. They soon become yellow or brown, and afterwards black; and they seem to rise, thicken, and grow up in a roundish shape, on the stalk and leaves of the plant. From the time that these spots are found, the vigor and luxuriant growth of the plants evidently decline, and they make no further progress towards maturity. The stalk becomes so brittle, that it breaks under the flail, and emits dust of a disagreeable flavor, affecting the breathing of the workmen.†

As mildew, whenever it falls on grain crops, arrests the farther growth of the plants, and exhausts the juices that should have matured the grain, it is advisable, to reap the crop whenever the disease appears, and before it extracts the natural juices of the plants. The grain produced by an infected plant is small, poor, and of a pale color, but as it contains none of the rust, it is not unwholesome food.

2. *Causes of rust.*—Several of the accidents enumerated in a preceding section, (No. I. p. 53,*) may contribute to the production of rust; but the principle causes are, having the land in too rich a state for corn crops; a too frequent repetition of so exhausting a crop as wheat, more especially on weak soils, which renders the application of much manure necessary; or when the crop meets with a check in its progress to maturity, and in that weakened state, is exposed to heavy rains, or variable weather.

It has been well observed, that when crops, *intended to ripen their seed*, are objects of culture, there is only wanted a degree of vigor and luxuriance in the plants, sufficient for that purpose; and if the fertility of the soil be raised to a much higher pitch than is necessary, or consistent with that object, injurious, rather than beneficial consequences may be the result.† Land may be too rich for corn crops, and it is better to keep it in a *well-balanced condition*, or in a medium state of productiveness, than in too fertile a state.‡ A superabundant quantity of sap and juices, in vegetables growing on highly cultivated lands, it is evident, must necessarily render them more susceptible of the effects of sudden and extreme changes, and consequently more liable to disease. Besides, as mushrooms are produced on beds of dung, great quantities of manure must promote the growth of fungi, or parasitical plants, on the crops of wheat, if they are once infected. The wheat produced on the site of a dunghill, is always rusted, even in the most favorable seasons; and if the whole field is a species of dunghill, how can it escape?§ The whole fungus tribe are seldom seen to grow, but from superfluous vegetable matter, as rotten wood, thatch, dedecayed hay, or some light rich substance, aided by a certain degree of heat and moisture; and there is no substance more analogous to such a

---

* Rust is the proper name, being a literal translation of the French "*La Rouille*," and the Latin "*Rubigo*." The disease has at first a brownish, *rusty* appearance, which afterwards becomes black.

† Sir Joseph Bank's Account of the Cause of the Mildew in Corn. Communications to the Board of Agriculture, vol. iv. p. 399. See also the Translation of M. Desmazieres's Paper on the Diseases of Wheat, annexed to "Hints on the Agricultural State of the Netherlands," p. 22. The celebrated Tessier was the first naturalist, who directed his particular attention to this subject, in his work entitled, "Traité des Maladies des Grains."

* Pliny (Lib. 18. c. 28,) attributes the rust to frost, and in this way it may be accounted for. If frosty nights are succeeded by hot gleams, disease is inevitable, unless the frost could be shaken off, before the influence of the sun is felt. It is a singular fact, that plants of wheat under trees escape rust, though the neighboring crop is infested with it.

† Hence the great advantage of having previously a green crop, to absorb the superabundant and injurious richness of the dung.

‡ Communication from Dr. Conventry. It is stated in a letter from Mr. Wm. Scott of Horncastle, (Farmer's Journal, Nov. 20. 1815,) "That wet falling on soils *full of manure*, causeth too luxuriant a growth of corn, from whence springs mildew." This doctrine is sanctioned by the authority of Parmentier, who ascribes the rust, "à l'abondance d'un suc nourricier, resultant d'une vegetation trop vigoureux, plutôt qu'aux brouillards, qui n'y ont aucun part directe. Traité sur la Culture de Grains."—Vol. i. p. 242.

§ Communication from John Middleton, Esq.

production, the offspring of corruption, than dung. This may be regarded at least, as a proximate, or predisposing cause. If the seeds of the *fungi* float in the atmosphere, they more easily find a *nidus*, on too succulent and lusty growing plants, the substance of which is in a tender state, and the pores more dilated, than in the hard straw produced by a compact soil.*

A too frequent repetition of crops of wheat, more especially when accompanied by great quantities of manure, to force a crop, or raised on soils unsuitable to the growth of that crop, will often have the same effect. The rust was but little known in the western, or the northern parts of England, or the southern counties of Scotland, until of late years, when every exertion has been made, to increase the quantity of that grain. Even clay lands, so congenial to wheat, have been injured by such severe cropping; but on weaker soils, as sandy and calcareous loams, the plant has suffered, in respect both of quantity and quality.

It is well known, that loose and open soils such as turnip lands in general, are the most apt to be rusted; and the reason is, that the roots in them, are the largest and longest, and generally, in search of moisture, run the deepest into the soil. The stems are thence luxuriant, large and porous. The roots being long and straggling, often get into a noxious stratum below, or into one not productive of nourishment. When that is the case, the plant, formerly luxuriant, meets with a sudden check, (for it is only from the extreme points of the roots, that the plant derives its nourishment by absorption;) and this sudden check *predisposes it to disease.* If then the month of July is accompanied by warmth and moisture, or even the beginning of August, the plants of wheat, in their weakened state, will be attacked by those *fungi*, to the propagation of which, that description of weather is so favorable, more especially in places where a free circulation of air is wanting.

In proof of the doctrines, it may be observed, that in loose and open soils, *treading the land thoroughly*, after it is sown, is an effectual preventive of the mildew; the roots being thus hindered from becoming loose and straggling, or getting into poor or noxious strata, whence no nourishment can be derived.

3. *Remedies against rust.*—Among the remedies likely to diminish the effects of this fatal malady, the following have been particularly recommended: 1. Cultivating hardy sorts of wheat; 2. Early sowing; 3. Raising early varieties; 4. Thick sowing; 5. Changes of seed; 6. Consolidating the soil after sowing; 7. Using saline manures; 8. Improving the course of crops; 9. Extirpating all plants that are receptacles of rust; and, 10. Protecting the ears and roots of wheat, by rye, tares, and other crops.

1. In a plant of which there are such a number of varieties, as in the case of wheat, it is evident, that there may be some, distinguished by peculiar properties, and consequently less liable to disease.* It is said that the red wheats† are hardier than the white, and that the thin, or smooth-chaffed, are less apt to be rusted, than the thick-chaffed sorts. A variety of red wheat, called *creeping-wheat*, is much cultivated, on that account, in Yorkshire, and on the borders of England and Scotland;‡ and in Worcestershire, the farmers are partial, on account of the hardiness, to a species of cone wheat, originally from Courland, which is not so apt to be injured in bad weather.

2. Sowing wheat early, is a preventive that has been long recommended, with a view of having the ear filled, before the season is likely to be injurious.§ In confirmation of that doctrine, it is remarked, that in the county of Somerset, the crops were formerly reaped much earlier than at present, the wheat harvest being generally over in the month of July,) and that *the rust or mildew was then unknown.*¶ A farmer in Essex, who was accustomed to sow his wheat after beans, had his crops constantly rusted, but was no longer troubled with that disease, *when he sowed early* either on clover leys or after a fallow. In Bedfordshire, it is remarked that wheat which *mays*, or turns yellow in that month, (which is in general, the consequence of being sown early,) never mildews.‖ It is no advantage, however, to have the wheat too forward in spring, and the sowing should not, on that account, be commenced earlier than the beginning of September, even on fallows. A distinction ought likewise to be made, between cold, wet and heavy soils, and the light, dry and porous ones. It is well known that the latter, though even a month posterior, will be as soon, if not earlier, ready for the sickle.

3. As sowing early is attended with some disadvantages, (the nourishment in the soil being exhausted *by the stalk*, before the formation *of the seed* commences, the plants becoming winter proud, as it is called, or too forward for the season, and the crop being more apt to be injured by spring

* It is remarked by Mr. Holdich, that the disease is generally in proportion to the broadness of the leaf; that it first takes place upon the upper leaf or sheath, out of which the ear issues. When this is narrow, small, and early withered, there is little danger from rust. Those broad leaves ought, if possible, to be got rid of, which perhaps may be effected, when the crops are drilled.

* Spring wheat is said to be not so liable to be rusted as other wheat, in Dorsetshire, (Report p. 213,) and in South Wales, (Report, vol. i. p. 399,) but equally so in Derbyshire, (Report, vol. ii. p. 119,) and in other districts.

† Near Exeter, they have lately got a red foreign wheat, which, it is said, is not liable to be rusted.

‡ General Report of Scotland, vol. i. p. 447.

§ Worlidge's Systema Agriculturæ, vol. i. folio, p. 210. Printed an. 1681. On the advantage of early sowing, see Oxfordshire Report p. 151, 152; Northamptonshire Report, p. 86; Berks Report, p. 200; Dorset Report, p. 209, 210, &c. By early sowing, the autumnal rains may be avoided, which put the plant in a succulent or plethoric state, and consequently render it liable to infection. In dry weather, the straw is of a firmer texture, and affords no admission to the seeds of the fungus, that may be slightly attached to them, *if the disease be thus propagated.* Bedfordshire Report, p. 383. That, however, is much doubted.

¶ Communications to the Board of Agriculture, vol. v. p. 202.

‖ Bedfordshire Report, p. 377.

frost,) it would be very beneficial, to procure a sort of wheat, either from some foreign country, or raised by selection at home, that would ripen early, without being sown much sooner than at present. Nature produces numerous *varieties of the same species*, belonging to the same genus; and it is incumbent on the attentive and industrious farmer, to avail himself of the circumstance, from which so much advantage might be derived.*

4. It is a maxim with many farmers, "*That thick crops are sometimes mildewed, but that thin ones generally are so, in a greater or less degree.*"† This arises from the following circumstances: when the seed is sown thick, the roots, instead of becoming long and straggling, are short and numerous. They are retained in the soil, more especially when the crop is drilled, that has been prepared for their reception, instead of wandering into strata, either poor or noxious. From the number of these roots and stems, the richness, which would be injurious to a few plants, only does justice to a number; for the same quantity of dung that might give twenty stems a disposition to disease, would only yield a proper quantity of food, when it had fifty to nourish. There is *no tillering*, which necessarily produces weaker plants, liable to disease. By thick sowing in drills all the advantages of treading, *in so far as respects rust or mildew*, will be obtained, for the roots of the plants will be short and numerous, and matted together, instead of being long and straggling.

It is proper here to allude to a communication of much moment, from which it appears, that in former times, when four bushels of wheat per acre were sown, the mildew was of much rarer occurrence, than since the practice of thin sowing has been adopted;‡ and there can hardly be a doubt, if the land is in good order; if the crop is sown early; if four bushels of seed are sown under the drilling system; and if the wheat is preceded by a green crop, so as to exhaust the pernicious qualities of the dung, that the crop of wheat will not be rusted.

It is proper to add on this subject, that it is much more prudent, to rely on the abundance of seed, than on the effects of tillering. When the latter is depended upon, during the time that the process is going on, much time must be lost, in the growth of the plant to maturity. The consequence is, both a later, and a more unequal ripening.

5. As wheat is not an indigenous, but an exotic plant, it might be less liable to disease, if the seed were occasionally changed by importations from foreign countries. The best Flemish farmers, regularly change their seed every two years, and assert, "that by this renewal of seed, all the maladies of grain are prevented." Some purchase their seed from d'Armentiere, near Lisle, in French Flanders, while others recommend wheat grown in the *Polders*, (a species of salt marsh) in Holland, by means of which, they maintain, that the rust is avoided.*

It is likewise stated, on the respectable authority of an eminent naturalist, (T. A. Knight, Esq.) that by crossing different varieties of wheat, a new sort may be produced, which will completely escape being rusted, though the crops in the neighborhood, and in almost every district in the kingdom, may suffer from it in the same year.† These circumstances tend to prove, that the rust does not depend solely on atmospheric influence, otherwise it could not be prevented by changes of seed, or by the crossing of different varieties.

6. The advantages of treading light soils, have been already explained.‡ It may be proper, however, to state the following facts, in support of the doctrine that treading will prevent the rust. In 1804, a farmer sowed 25 acres of a pea-stubble with wheat. After the usual operations of ploughing, scarifying, manuring, sowing and harrowing, it was trodden with sheep, to the consistency of a highway. The produce was 32 bushels per acre. For the sake of comparison, a part of the field was left in a light state, untrodden, and it was rusted. The same farmer had 14 acres of wheat planted with potatoes. The potato tops were pulled up, and the wheat sown on the surface. The potatoes were then forked and dug up, and the wheat trodden by the women and children in picking up the potatoes. The crop was free from rust, and of excellent quality. It has often been remarked, that when a field has been destroyed with rust, the head lands, which the horses have trodden much in turning, have generally escaped.§

7. The advantage of using saline manures, as a remedy against the rust, (a late discovery,) is an important circumstance. Its success seems to be proved, by the practice of several farmers in Cornwall, who have been in the habit of sowing, about a fortnight before the turnips, the refuse salt of the pilchard fishery, as a manure for that crop, in the proportion of 31½ bushels of salt, (56 lbs.

---

* In Cornwall, they frequently sow a mixture of red and white, (provincially, *dredge-corn*,) and the crops are more abundant when sown mixed, than when sown separately. When separate, the produce may not exceed 18 bushels per acre; whereas when the two sorts are mixed, the produce will amount to 24 bushels.

† It may be asked, what is thick and what is thin sowing? That must evidently depend upon the fertility of the soil, and the period of the year when the seed is sown.

‡ See Mr. Purt's Letter, annexed to Mr. Blaikie's, printed in the Farmer's Journal, dated Holkham, Oct. 12th, 1820.

* That eminent farmer, Robert Barclay, Esq. of Ury, in Scotland, brought his wheat seed from England every two years, and sowed only what was produced from English wheat the preceding year.

† In Italy, they recommend thin sowing, alleging, that as the infection may go from ear to ear, it is less apt to spread, when the ears are not in contact. But this seems to be erroneous doctrine.

‡ A farmer has gone so far as to assert, that if the land, be the soil what it may, were trodden by a troop of horse, or a drove of cattle, after being sown with wheat, there would be scarcely such a thing as the rust known. But it is obvious, that treading in this way would do no good to clay land, but on the contrary, might much injure the crop. Light soils are more liable to produce mildewed wheat, because the plants grow too fast in spring, and have long and straggling roots.

§ It would not be difficult to invent a machine that would compress the land, if that operation would effectually prevent the rust.

each,) per statute acre. They all agree, that they have never had any rust on their wheat, where this practice was adopted, though before, they were greatly affected by it.* The expense would be inconsiderable, since the tax on salt has been taken off. The uses of salt in animal life, prove how beneficial it would be to vegetables. In animals, it is found to promote perspiration, *and to prevent corruption in the juices*;† and consequently it is the most likely means of checking the propagation of fungi, and preventing that rottenness and corruption, to which wheat is liable when it becomes rusted. The doctrine is strongly supported by the following facts: 1. Rust is rarely experienced in the immediate vicinity of the sea, unless when the ground is greatly over manured;‡ 2. When sea-ooze is employed as a manure, impregnated as it is with saline particles, the crop generally escapes that disease; and, 3. Rust is little known in Flanders, where Dutch ashes, *full of salts*, are in use.

8. As land in too rich a state, is apt to produce rust, it is found to be an effectual remedy, if, previous to a crop of wheat, the dung be applied to a smothering crop, as tares, hemp, or cole-seed, on strong lands, or potatoes on light soils. Indeed wheat after cole-seed, is scarcely ever known to be rusted.§ The general culture of that article, and the use of Dutch ashes, impregnated with saline matter as a manure, tend greatly to that exemption from rust, by which wheat in Flanders is distinguished. Potatoes, *when the crop is large*, have sometimes had the same effect. A field was sown with wheat, partly after summer fallow, partly after clover ley, and partly after potatoes; the two former portions were found rusted, whereas the part where the potatoes had been sown, produced grain, plump and equal, and only deficient about one-tenth of the usual quantity. Wheat, after a thin crop of potatoes, is, however, often rusted in this country; but in Flanders, where the wheat is never materially injured by rust, potatoes are considered, in its highest cultivated district, (the Pays de Waes,) as the best preparation for that crop. If too much dung occasion the propagation of fungi, which there is reason to believe is the case, smothering crops, by exhausting and diminishing the strength of dung, may take away that tendency.

9. Mr. Clack, the respectable Rector of Milton in Devonshire, whose communication on the subject of rust is one of the most valuable hitherto published, strongly recommends the cutting down all those plants which retain the fungi, in their various stages, even during the severest frosts of winter, and which, on the return of a little mild or humid weather in spring, are thought to contribute to affect, with an astonishing rapidity, the earliest leaves and shoots of those vegetables, which are congenial to their propagation. These fungi flourish with such an extraordinary luxuriance, that in the course of a week or two, they seem to arrive at maturity, and disseminate their baneful effects throughout thousands of acres, on which depend the profit of the husbandman, and a large proportion of the sustenance of the community.*

Among the common plants, the colts-foot, the corn marigold, and the common couch, are said to be so favorable to the growth of these fungi, that no field can be free from rust, in which they are to be met with. Every exertion ought therefore to be made, for their total extirpation.

Some evergreens seem to retain these fungi, during the coldest seasons, as the box, when planted in low and damp situations, and above all, the bramble-bush, which ought to be cut down as close as possible, in hedges and coppices, at least once or twice a year. The abele, or silver poplar, and willows, ought likewise to be kept under, as some of the chief causes of rust in their neighborhood.

Several trees also, retain old fungi during winter, on their barks, as the black alder, the common willow, the hazel, the birch, and sometimes oak coppice. The barberry retains this source of mischief, in any fissure or cleft in the bark occasioned by injury, exhibiting numerous black postules. These should be cut out. The contradictory accounts regarding the effects of the barberry-bush, in occasioning rust, may thus be explained. Where the skin is smooth and entire, the barberry does little or no mischief; where there are fissures in the bark, it proves the source of destruction. Hence also, when the barberry-bush is small, it does not occasion mildew.†

The practice of cutting the hedges, when a crop of wheat is sown, ought to be universally adopted, as a likely means of lessening the quantity of fungi, that would otherwise injure the crop. By this attention to the improvement of his hedges, and the extirpation of weeds, Mr. Clack's glebe, on which, from time immemorial, the wheat was subject to rust, has been rendered nearly as free from that disorder as the open fields of his neighbors.‡

10. A curious and most important circumstance, connected with the rust in wheat, remains to be stated. In the northern counties in England,

---

* Particularly Mr. Henry Sickler, whose practice was communicated in a letter to a respectable Member of Parliament, Davies Gilbert, Esq.—See also the evidence of Dr. Paris, before the Salt Committee of 1818, p. 30.

† Code of Health, 4th edition, p. 178.

‡ Essex Report, vol. I. p. 301; Dorset Report, p. 209.

§ General Report of Scotland, vol. ii p. 530; Dumfriesshire Report, p. 31, and Appendix, No. VI. p. 581.

* Devon Report, p. 436.

† Bedfordshire Report, p. 379.—The facts brought forward in the County Reports, Cheshire, p. 134, Cambridge, p. 131, seem to prove the fatal effects of the barberry, in occasioning rust.

‡ In a recent communication, dated 16th June 1817, Mr. Clack states, that in the year 1811, he sowed a field of wheat after clover, which was notorious for rust; but the crop produced next year was the best in the neighborhood, which he attributes to his continued attention, in cutting out such shrubs, as were congenial to the growth of rust, in the adjoining coppice and hedges; and to the consolidation of the soil, by filling it with sheep after sowing, for which purpose, a number should be collected, and slowly driven in a compact body, so as to give a simultaneous effect to the land.

where it is the practice to sow what they call *meslin*, (blend corn,) or a mixture of rye and wheat, it has been there remarked, that wheat thus raised *is rarely infected by the rust.** It is singular, that the same circumstance has been observed in Italy. In an account drawn up by the late Professor Symonds, of Cambridge, on the climate of that country, it is recorded as a known, but extraordinary fact, "that wheat, mixed with rye or tares, (for it is a frequent practice there, to sow tares with wheat,) *escapes unhurt.*"† It would appear, from tares being so useful, that the seed of the fungus must be taken up *by the root*, and that if the root be protected it is sufficient. This seems to be countenanced by other circumstances, as, that by treading the ground, and thick sowing crops of wheat, the crop is less liable to be infected by this disease; the access of the seeds of the fungi, to the root, being rendered more difficult. The effect of tares as a preventive, may easily be tried. The double crops sown in Flanders, where the rust is hardly known, is another circumstance strongly favorable to the idea, of the advantage derivable from covering the roots of wheat from infection. Mr. Knight is decidedly of opinion, that the disease is taken up *by the root*, (every experiment to communicate it from infected straw, to others, proving abortive;) and indeed, if it were introduced at the ear of the plant, how could it descend, and infect solely the stem? which is the case, unless when the disease is inveterate. Others attribute rust to the influence of the sun upon the roots. Hence the advantages of having a thick, rather than a thin crop; and hence, it is said, the beneficial effects of mixing rye with wheat, the rough bending head of the rye, protecting the earth from the power of the sun. It is also a singular fact, that plants of wheat under trees, escape rust, though the neighboring crop is infested with it. This may be owing, either to the protection from the violence of the sun, or the moisture which is retained in the soil, by the means of the shade thus procured.

By one or other of these means, and the improvements which may be effected, by the observations of ingenious naturalists, and the experience of intelligent farmers, there is every reason to hope, that the diseases of wheat may, in a great measure, be so mitigated in their effects, that they will not in future be felt as a national calamity. For that purpose, however, it is necessary, that the diligent farmer should seize every opportunity of improving his knowledge in the nature of those diseases, should note down all the circumstances connected with the subject as they occur, and should compare his observations with those of others; that whether the causes of rust are general, or local, they may, as much as possible, be obviated. He may be assured, that it is "*the perfection of good management*," to discriminate the causes to which the disorders of grain are owing, and to apply the cheapest and the most effectual remedies.

*East Riding Report, p. 127.—Mr. Tuke, the intelligent author of the North Riding Report, in a letter to the Author, dated 7th March 1818, states, that until the year 1815, rye grown amongst wheat, was generally allowed to be, in that district, a sure preventive of rust or mildew; but that year, rye itself was infected, and there was very little either wheat or meslin that escaped in Yorkshire.

† See Annals of Agriculture, vol. iii. p. 153.

From the Albany Cultivator.

PRESERVING ROOTS.

We find in Chaptal's "Chemistry applied to Agriculture," an excellent chapter on the preservation of animal and vegetable substances. We extract the following from the preliminary remarks.

"The nature of all bodies which have ceased to live or vegetate, are changed, as soon as the physical or chemical laws, by which they are governed, cease to act; the elements of which they were composed, then form new combinations, and consequently new substances.

"Whilst an animal lives, or a plant vegetates, the laws of chemical affinity are continually modified in its organs by the laws of vitality; but when the animal or plant ceases to live, it becomes entirely subject to the laws of chemical affinity, by which alone its decomposition is effected.

"The principles of the atmospheric air which is imbibed by the organs of living bodies, whether animal or vegetable, are decomposed and assimilated by them, whilst dead bodies are decomposed by its action. Heat is the most powerful stimulant of the vital functions, yet it becomes, after death, one of the most active agents in the work of destruction. Our efforts, then, for the preservation of bodies, ought to be directed to counteracting or governing those chemical or physical agents, from the action of which they suffer; and we shall see that all the methods which have been successful, are those which have been formed upon this principle.

"The chemical agents which exert the most powerful influence over the products of the earth, are air, water and heat; the action of these, however, is not equally powerful over all classes of plants; the soft and watery, and those which approach the animal matter, decompose most readily; the principles of such are less coherent, less strongly united than that of others; so that the action of disorganizing agents upon them is prompt and effectual.

"All the methods now employed for the preservation of bodies, consist in so far changing their nature, as to deprive them of the elements of destruction contained within their own organs: or in secluding the substances to be preserved from contact with the destructive agents mentioned in the preceding paragraph; or in causing them to imbibe certain other substances, the anti-putrescent qualities of which counteract all action, whether of internal or external agents.

"In all vegetable products, water exists in two different states, one part of it being found free, and the other in a state of true combination; the first portion, not being confined except by the covering of the vegetable, evaporates at the temperature of the atmosphere; the second is set free onlyat a temperature sufficiently high to decompose the substances containing it: the first, though foreign to the composition of the vegetable, enters into every part of it, dissolving some of its

principles, serving as a vehicle for air and heat and being converted by cold into ice; by these several properties it greatly facilitates decomposition: the second portion, from which no evil of the kind arises, is found combined and solidified in the plants, and its action is thus neutralized."

Drying fruits, then, in order to preserve them, consists in depriving them of the water contained in them in a free state. This may be done by subjecting them to heat, not exceeding 95 or 113 degrees; either by exposing them to the sun, or in a stove room, or in ovens, which latter practice is resorted to, even in the warmest countries, at the commencement of the drying process. In preserving the apple, for instance, our author adds, that by depriving their surface of all moisture before putting them up; keeping them in dry places, where the temperature will be constantly between 50 and 54 degrees, and by separating the fruits that they shall not come in contact, they may sometimes be preserved 18 months. The farmer in Schoharie, who has been in the habit of bringing the Spitzenberg to our market on the 4th of July, owes his success to the observance of these rules.

On the preservation of the fruits of the earth by secluding them from the action of air, water and heat, M. Chaptal enumerates the following leading causes of decay.

"The atmospheric air, coming in contact with fruits, deprives them of their carbon, and forms carbonic acid.

"Fruits exposed to the solvent action of water suffer decomposition, by having the affinity existing between their constituent principles weakened, and at length destroyed.

"Heat dilates the particles of bodies, and thus diminishes the force of cohesion and attraction, and favors the admission of air and water.

"The combined action of these three agents produces very speedy decomposition; the effect produced by any one of them is slower, and the results different. So that in order to preserve fruits from decomposition, it is necessary to guard them from the power of these three destroyers."

Practically applied, these axioms teach, that to preserve roots in good condition, the following precautions should be observed:

1st. That their surfaces be entirely freed from moisture before they are housed or buried, and that they be deposited in a dry situation, where water will not have access to them.

2d. That they be excluded from the air, by burying them in dry earth, or slightly covering them in the cellar with earth. And

3d. That they be kept in a cool temperature; the best ranging from 34 to 45 degrees.

We frequently hear housekeepers complain, that their potatoes, turnips, and other vegetables soon deteriorate, and lose their fine flavor, after they have been a short time in their cellars. This is a natural consequence of the injudicious way in which they are too frequently kept: exposed to the atmosphere, and to a high temperature, in a cellar adjoining the kitchen, or perhaps in the kitchen itself. Again, potatoes or turnips buried in a wet condition, or the latter with parts of their tops left on, are very liable to ferment and spoil. We find it to be a necessary precaution in burying turnips, to make one or more holes in the crown of the pit, to let off the rarified air, and abate the heat which is almost invariably generated on their being buried.

In preventing the total loss of potatoes that have been affected by frost, Thomas Dallas directs, that when they are slighdy touched by the frost, it is only necessary to sprinkle the roots with lime to absorb the water under the skin; that when the outer portion of their substance is frozen, the tubers may be pared and thrown for some hours into water slightly salted; and that when they are wholly frozen, they will yield, upon distillation, a spirituous liquor resembling the best rum, and in greater quantity than roots which have not been frozen.

The quotations we have made above are invaluable to the farmer and housekeeper; and if the principles which they establish are understood and practised upon, we shall have no cause to regret the length to which we have extended this article.

From the Genesee Farmer.

SUGAR.

Mr. Tucker—I have seen in some late numbers of the Farmer, inquiries relative to the manufacture of sugar from beets and potatoes. The inquiry, as far as relates to beets, you have answered in your last number; and the process of manufacture where potatoes are used, has been already fully and ably described in the Farmer, in vol. 2d, at page 38, in an article prepared by a practical operator, Mr. Guthrie of Sackett's Harbor, for Professor Silliman's Journal. Mr. G. made large quantities of molasses from potatoes, but with all his skill was unable to crystalize or grain it, without the introduction of some deleterious substance, lead for instance; and consequently all his was used in a liquid form, of the consistence of thick syrup, or rather honey. The potatoes were first converted into starch, and then by boiling in sulphuric acid, diluted, for some hours, into sugar. The directions in the Encyclopedia Americana for this process, are 2000 parts of starch, 8000 parts of water, and 40 parts strong sulphuric acid—the mixture to boil some thirty six hours in silver or lead; but Mr. Guthrie accomplishes the conversion by the use of steam in about six hours. The production of sugar or molasses is possible from a great variety of materials provided by nature, such as the cane, maple, beet, honey—all plants that afford starch, or substances that by chemical process can be converted into gum, as flax, linen rags, &c.; still none have yet been found, which can successfully enter into competition with the cane, where it is grown in favorable circumstances, and the production or use of sugar is unfettered with vexatious restrictions.

In your article on beet sugar, it is remarked that "chemistry has discovered a new material for sugar in wheat, the great staple of the west." That starch could be converted into sugar, has long been known; and it is only the starch in wheat, potatoes, or arrow root, that is thus convertible. Starch by some chemists, and particularly Prout, is considered as sugar partly organized; and though containing but a small quantity of carbon and hydrogen more than sugar, still this excess is

sufficient to prevent its crystalization, or conversion by nature into sugar. The following table prepared from the statements of Borzelius, Raspail and Dumas, by Dr. Prout, shows in a curious and interesting light, by what mere shades of difference in their constituent atoms, substances, which to the sense appear as far apart as the zenith from the nadir, are separated. Water is composed of definite and well ascertained proportions of oxygen and hydrogen, and in the formation of sugar, starch, acetic acid, and lignin, or the pure woody fibre of trees and plants, these two materials are found united in the same proportions as in water; the only ingredient added for their completion being carbon. These substances, sugar, acetic acid, starch, and lignin, may therefore be considered as composed of carbon and water in the proportions here given.

	Carbon.	Water.
Sugar.—100 parts of sugar from starch contains	36,20	63,80
From honey	36,36	63,64
From East India moist	40,88	59,12
From beet root and maple	42,10	57,90
From English refined	42,05	58,05
From sugar candy pure	42,85	57,15
Acetic acid	47,05	52,95
Starch.—Arrow root in its ordinary state	36,04	63,06
From wheat in its ordinary state	37,50	62,50
From wheat dried 212°	42,80	57,20
Lignin.—In its ordinary state of dryness	42,70	57,30
From willow dried 212°	49,80	50,20
From box do.	50,00	50,00

Dr. Prout, in his Bridgewater Treatise, remarks "that both starch and wood can by different artificial processes be converted into sugar or vinegar. But we are unable to reverse the process, and convert vinegar into sugar, or starch into wood." The chemist Braconnet has ascertained that a pound of linen rags yields rather more than a pound of sugar. The finest crystals of sugar I have ever seen were from that of the maple. They were a quarter of an inch in length, and an eighth in breadth, flattened six sided prisms, terminated by similar sided summits. These crystals were as clear as flint glass, very hard and brittle, and not easily soluble.

W. GAYLORD.

From the Silk Culturist.

EXTRAORDINARY INCREASE.

Nurserymen, unacquainted with the cultivation of the Chinese mulberry, are probably not aware of the extent to which they may be multiplied, in a single season. In order to show the number that may be produced from a single tree, we will state the result of an experiment by Mr. Bestor, of Suffield, the present year. He laid down the branches of two trees, and thereby produced *two hundred and two* in addition to the original stocks. From the product of one tree he has already sold forty-eight, at twenty-five cents each, receiving therefore the very handsome profit of $12, and having one hundred and fifty-four remaining on hand.

From the Silk Culturist.

ANSWER TO THE SOUTH—ON THE PROFITS OF RAISING THE MULBERRY.

In our last number we promised to give our friends in the south a fair and impartial opinion respecting the aggregate amount of net profit which may be reasonably expected from an acre in mulberry; and expressed a hope that it would be sufficiently encouraging to induce the young men of Virginia to remain on the plantations of their ancestors,and give their attention to the culture of silk. We are aware of the various estimates which have been made by practical culturists, and are fully satisfied that most of them are erroneous in their results. By this we do not mean that the gentlemen who have made them have intentionally misled the public; but that they have misjudged with respect to a fair average crop. Some of these estimates are manifestly extravagantly high; while others are as manifestly below the truth. Were we to take the medium between the two extremes, we are inclined to believe it would be as near an approximation to the truth as the present state of the business will admit. Taking this then as our data we should be brought to the conclusion that from $125 to $150 net profit, may be expected from an acre of full grown trees, or covered with full grown hedges. It was also our intention to have accompanied the expression of our opinion with a comparative statement of a silk, with other crops. Farther reflection, however, on the subject has convinced us that this can be better done by detached articles on distinct crops, than in a long article embracing the whole. We have therefore decided on this course, and in another column will be found a communication from an intelligent gentleman in the state of New York, on the profit of a dairy, and an editorial article on the profit of a wool crop, from an authentic source. The profits of other crops will be given hereafter.

From the Silk Culturist.

POOR AND DRY SOILS BEST FOR MULBERRY CULTURE. CHINESE MULBERRY.

The soil best for the production of good silk is another view of the subject of which I shall now say but little. The warmer and sweeter the soil, wherever found, the richer the foliage, and the better the silk will be of course. The hottest sand soil that trees ever grew on will produce the best silk; all fruits and vegetable productions being more or less nutritious and high favored as heat prevails in the soil in which they grow. The pravalence of moisture, as in the night and wet days, by causing an abundant flow of sap, relaxes, expands and increases the growth of plants—the heat, that prevails in the day and in droughts dries away the watery parts, sweetens and matures the growth as it is acquired—then, as moisture expands and heat condenses, moist soils may produce the greatest quantity of foliage, and hot the best in quality. Those persons, who pronounce this or that mulberry superior for the production of the finest silk,

will do well to recollect that the foliage of the same tree may vary as much in quality, by growing on different soils, as the products of the same aromatic plants grown in torrid and temperate climates. That soil should be selected for the business, that will be the hottest, and at the same time, safest in regard to the health and vigor of the tree. The kind of tree should be selected best adapted to, and that will produce the greatest quantity of foliage on poor soils. This, I think, is the Chinese mulberry. It is yet to be learned how poor a soil it will flourish in; as yet I have not put it on any land too poor for it—though I have set it on light sandy loam that would not produce eight bushels of rye to the acre—where it grows quite fast enough and the soil has gradually been improving. I would recommend to any one wishing to engage in the silk business, to set out as few or as many as he can afford; but at any rate set the Chinese mulberry four by three, or four feet apart—then multiply them by layers and cuttings, not by innoculation and grafting, till they have covered as much ground as wished for—the trees to be kept within reach and continued in large plantations. I think one man, constantly employed, with a horse plough and cultivator, after the first season, may give fifty acres of free soil all the cultivation necessary. The white mulberry, but should prefer the dondolo, I would set by roads, fences, &c. for standard trees—so that all parts of a farm might be contributing to forward the business in every possible way.

Our neighbors of the states north of us, can advantageously engage in the silk business with the Chinese mulberry if soil, location, and cultivation be resorted to as here described, that will mature the tree before winter. This tree comes recommended from its native soil, as well adapted to the high northern parts of China. The length of the season has nothing to do with its wintering, if it is prepared, and if not, though it may be located many miles south of us, it will be destroyed. More care will be necessary in choosing soil, &c., as we go north; long seasons are preferable to short ones, as they will afford more time to prosecute the business. But the great value of this tree consists in its continuing so long and furnishing at all seasons of its growth, such an abundance of suitable food for the young and full grown silk worm—the leaves of the common tree becoming spotted early in the season, and unfit for use. But this disposition, in this tree, of continuing long in growth that so much enhances its value, will be liable to cause its entire destruction, if not properly managed. This tree has had the misfortune, being so highly esteemed, to find itself located in rich soils and gardens highly manured, which would protract the growth of many forest trees to the frosts of autumn, and thus, as expressed by Mr. Whitmarsh, "we kill the tree with kindness." If our friends in Mansfield can make the rearing of silkworms a source of profit, by a few weeks use of the common tree, what may we expect, when the eye of the traveller is constantly meeting on almost every farm, plantations from one to fifty acres clothed like a corn field with their rich foliage, and the same soil, cocoonery, apparatus and hands employed from the opening of the leaf in spring to the severe frosts of autumn, a term of nearly six months—and even longer by picking the leaves before severer frosts as they may be kept much longer than the leaves of the white mulberry—and this same set of hands may spend the winter in reeling and preparing the silk for market. What business promises equal profits?

After having four years experience in the cultivation of this mulberry, notwithstanding the fears expressed in many periodicals of its ability to endure our climate, I can say that I believe it will far exceed the most sanguine expectations ever entertained of it in this country. I expect to be fully compensated for the many losses I have sustained in its cultivation—for I hope and expect to see the day, and that not far distant, when the growing and manufacture of silk will become a source of greater wealth to this country than the raising and manufacture of both wool and cotton.

The frost here last week killed most of our vines and froze the leaves of the Chinese mulberry quite stiff; but did it no injury. Occasionally one or two of the small top leaves are dried up. After the last year's frosts every leaf was as dead and black as if scorched by fire. Should the tree kill to the ground annually in the fall, and sprout in the spring, I should prefer it to all others for the silk business.

* * * * *

JOSEPH DAVENPORT.

From the last London edition of the "Complete Grazier."

ON THE BREEDING, REARING, AND FATTENING OF SHEEP.

[Continued from p. 396 Vol. III.]

On the shearing of sheep.

The shearing of sheep is an object of very considerable importance in rural economy. The most proper time for this purpose must be regulated according to the temperature of the weather, in the different parts of this island. If it be hot, the month of June may be fixed, though some breeders defer it till the middle of July; under the idea, that an additional half pound of wool in every fleece may be obtained, in consequence of the increased perspiration of the sheep. An early shearing, however, is preferable, where the weather and other circumstances will admit of the operation being performed; because the new wool will not only gain time to *get a-head*, but the animal will also be secured from the attacks of the fly, to the depredations of which it becomes liable by delaying the operation.

Previously, however, to shearing, the sheep ought to be washed, in order to remove the dust and other filth which they may have contracted; this is usually performed in some neighboring stream, or even in a common pond, by men standing in the water, who, not unfrequently, become seriously indisposed in consequence. To prevent this inconvenience, as well as the abuses resulting from the careless manner in which the washers frequently do their work, it has been proposed to rail off a portion of the water, for the sheep to walk into, by a sloped mouth at one end, and to walk out by another at the other end, with a depth sufficient for them at one part to swim. Pave the whole. The breadth need not be more than six or seven feet; at opposite sides of this passage, where the depth is just sufficient for the water to flow over the sheep's back, let in two casks, either fixed or loaded, each for a man to stand in dry; the sheep being in the water be-

tween them, they swim through the deep part, and walk out at the other mouth, where there is a clean pen, or a very clean, dry pasture, or rick-yard, to receive them for a few days, until they are thoroughly dry, and fit for the shearers: the lambs being first separated from the other sheep, and confined in distinct pens. A few planks will form a bridge to the tubs, and there should be a pen at the first mouth of the water, where the sheep may be soaking a few minutes before being driven to the washers.

Where, however, much dirt has fastened itself at the points of the wool, the "Farming Society of Ireland" think it might be wise to have a large tub of water at about blood heat, in which to place the sheep, till all the wool shall be well washed and softened, and that it should be river-washed directly after. This process, the society observe, would not be troublesome as might be supposed; for the heat of the animal will keep nearly a sufficient warmth in the water, which will at all events be produced by occasionally putting in a few pails full of hot water. And it is a fact worthy of remark, that the greater the number washed, the better will the water cleanse. On this subject, Mr. Bakewell also says, "It would be desirable that the Spanish and mixed breeds of sheep were also washed in this way, because it is not possible to cleanse the fleece by the usual practice of immersion in a river, without keeping the animal a long time in the water, and thereby endangering its health. Indeed I do not think the Spanish fleeces can be cleansed by the usual mode of washing, on account of the closeness of the pile. Were the Spanish sheep in this country washed before shearing as clean as the English, the value of their wool would be better ascertained by the wool-buyer, and a more general competition of purchasers would always insure a fair price for the article.

"The extra labor required to wash sheep in tubs with warm water and lie, or soda, would I apprehend, be amply repaid, were the water of the first and second washings carried out and applied as a manure. The quantity of rich animal soap it would contain must make it one of the most fertilizing applications which could possibly be used. The greased wool would require a greater quantity of soda to cleanse it than that of the Spanish or mixed breeds, where no ointment had been applied. I annex Baron Schultz's account of the Sweedish manner of washing sheep: I think some improvements upon it will suggest themselves to the intelligent wool-grower.

"Before the shearing, the wool is almost universally washed upon the sheep. Some persons wash the sheep in the open sea, or in running water, but this is never so clean as when the sheep are first washed in a large tub, with one part clear lie, two parts lukewarm water, with a small quantity of urine; and then in another tub, with less lie in the water; after which the sheep are washed, laying them always on their back, with their heads up, in a tub with clean water; and lastly, there is poured out on the sheep, standing on the ground, a sufficient quantity of water, which is as much as possible squeezed out of the wool. The sheep are afterwards driven into an unpastured adjoining meadow, and remain there (to prevent their soiling themselves in the sheep-house) a day and night, not only till they be dry, which in good dry weather happens within the third day, but also, if bad weather does not threaten, some days longer. Some persons wash their sheep twice, which I also once tried, but the wool becomes rougher in consequence of it, and in fact of a grayer appearance. The great quantity of grease which the finest Spanish wool contains at the first washing, mixes with the lie-water, and makes it quite soft and soapy; but this grease is wanting in the second washing, so that the water is not in the least softened. If the first washing be well performed, the wool is by that means several per cent. cleaner than the foreign wool that is imported, which has not been washed after the shearing."*

In Silesia, the latitude of which corresponds with that of many of our finest grazing districts, the method usually practised simply consists in making the sheep cross a running stream, after obliging them to plunge into the water from a pretty high bridge.

The method chiefly pursued in Saxony, consists, first, in making the sheep cross a brook or river; on the second day, in the morning, they are again made to pass through the water, in which they are dipped, in order that the fleece may be uniformly penetrated; after which they are stroked, or pressed down with the hand, beginning at the head, and thence proceeding to the extremities of their bodies. They are also led once in the afternoon, across the stream; the fleeces are then allowed two days to become dry, and on the third day they are shorn. A shearer dispatches twenty-five sheep in one day. When an animal is wounded, the part is anointed with its excrements, or with a mixture of linseed oil and resin. The shearing ceases about three o'clock in the afternoon, that the sheep may have time to feed in the meadows, whither they are gently driven after they have undergone the operation. After the shearing, some graziers fold their sheep for two or three weeks, sending them proper rations of food.†

In Spain, the sheep are shorn in large buildings constructed for that purpose, and the operation is conducted by persons who are not themselves proprietors of flocks, but who make this branch of the management their peculiar business. The fleece is then assorted into the different qualities, and carefully washed in warm water; but not more than is merely necessary to cleanse it from impurity, as too much washing is supposed to render the wool brittle. The fleece is thus cut and stapled at the same time; and it has been asserted that 800,000 sheep have been shorn in the season at one of these *esquileos*, at Ortigosa, in Segovia.‡

In *washing sheep*, the use of water containing chalk should be avoided; for this substance decomposes the *yolk* of the wool, which is an animal soap, the natural defence of the fleece; and wool, often washed in calcareous water, becomes rough and more brittle. The yolk is most useful to the sheep in cold and wet seasons by the re-

* Bakewell on wool, p. 72.

† See M. Lasteyrie's very valuable "Histoire de l'Introduction des Moutons à Laine fine d'Espagne dans les divers Etats de l'Europe, et au Cap de Bonne Espérance," &c. 8vo. 1802.

‡ Bourgoing: Tableau de l'Espagne Moderne, Vol. I. Ch. III.

sistance which its oily nature opposes to the rain; while it nourishes the growth of the wool, and also imparts to it a greater degree of softness and elasticity.

The *clipping*, or *shearing* of sheep, is performed in two ways, and either a barn, or a small shady paddock is usually chosen as the scene of operation. The first and most ancient, or common way, is done longitudinally, from head to tail; but this mode is attended with considerable difficulty, and is seldom well executed. The second, and improved method, consists in cutting circularly round the body of the animal, the beauty of which is, in consequence of this, believed to be increased, while the work is more uniformly and closely executed. The shearer holds the animal under him, either with his knee, or left arm, and clips the wool with a spring shears, which being without handles, he is enabled to manage with one hand, and thus performs the operation without assistance, unless the sheep are unusually strong and restive. The entire fleece is stripped at once, and rolled up together and the different qualities are afterwards sorted by the wool-stapler; but, previously to the sheep being handed over to the shearer, it is a good practice to clip off all coarse and kempy wool from the hips, legs, pate, and forehead, and keep it apart from the rest of the wool, in a bag or basket. This is particularly necessary to be observed in the shearing of lambs: for in lambs' wool, if the coarse part and kemps be suffered to mix with the fine, they never can be sorted out, and must spoil any fabric to which the wool may subsequently be applied, as the kemps will not take any die; and whatever color may have been intended, the article must be a mixture. Further, great care should be taken, in shearing, not to give the wool a second cut, as it materially injures and wastes the fleece.

During the whole process of shearing, the greatest care should be taken not to wound or prick the animal with the edge or point of the shears; otherwise the flies, abounding in the sultry heats of midsummer, will instantly attack the sheep, and sting them to very madness.

When shorn, the fleece should be carefully folded and rolled, beginning at the hinder part, and folding in the sides, or belly wool, as the rolling proceeds. When arrived at the shoulders, the wool of the fore part should be rolled back to meet the other, instead of having the binder twisted from thence in the usual manner, and the whole secured by a pack-cord in the common way in which parcels are tied up. Thus the fleece is kept much tighter together, and unfolds itself with more regularity under the hand of the sorter, who is otherwise much inconvenienced by the confusion or breaking of those parts of the fleece which, in the common method, are twisted together for the band.

In the preceding details, we have spoken of one annual shearing; but experiments have been made by some enterprising breeders, tending to show that, in certain cases, long-woolled sheep may be *shorn twice* in the year. The trial, however, has not been attended with any advantage; for although a trifling additional quantity of wool might be thus obtained, it would not be sufficient to pay for the additional trouble and expense: the quality, also, would be inferior in length of staple; and late shearing exposes the sheep to injury from cold. To meet this latter objection it has, indeed, been proposed to clothe them in flannel jackets, as practised by the breeders of the new Leicester rams; but although that may answer the purpose of Tup-masters who find their interest in supporting a peculiar breed of delicate sheep, it cannot be adopted generally, even if it were advantageous to the animal, of which many strong doubts are entertained. The external air and sun are necessary to the health of the sheep, which seems intended by nature, more than any other domesticated animal, for exposure to the weather. It is also probable that the system of clothing sheep is prejudicial to the growth of the wool both in strength and staple.

Mr. Ellman, of Glynde, clips off the coarsest wool on the thighs and docks of his South-down flock, (the first of that breed in this island,) about four weeks before the usual time of washing and shearing. The wool, thus severed, he sells as locks: each sheep yielding, upon an average, four ounces. He is said to find this method very beneficial, as the animals are kept clean and cool during hot weather; and from the success with which it was practised, it has been adopted in other counties with different breeds of sheep.

A more singular mode has for some years been tried at the French national farm, at Rambouillet, the result of which is stated to be, that the fleece of sheep improves greatly by being suffered to grow for several years; and that the fleeces of some sheep, which were shorn in 1804, for the first time for *three* years, and in 1814, for the first time for *five* years, were superior, in point of staple, to those which were annually shorn, and produced a larger sum. We state these facts for the consideration of the philosophic breeder; though we confess ourselves at a loss to reconcile them either with the generally received theory of the growth of the fleece, or with the effect of the very great degree of heat which the French sheep must have felt with such a weight of wool; especially, as it is the opinion of all well informed breeders, that excessive heat is equally hurtful to sheep as extreme cold.

Lambs have been usually clipped a short time after the rest of the flock; but, in this country, a custom has been lately introduced, of not, as formerly, shearing the lambs. The wool of the *Hoggets* thus acquires a great length of staple, or, as it is sometimes termed, a *longer nip;* it is chiefly used in the manufacture of shawls, and as it now commands a higher price than the other qualities, this is of the utmost importance to the proprietors of short woolled flocks: it is, indeed, the only kind of short British wool that has been, for some time past, saleable, except at prices that are ruinous to the grower.

After sheep have been clipped, it is usual to *mark* them with ochre, ruddle, or other coloring matter; but, as it sometimes becomes difficult to wash the stains of these substances out of the wool, a composition of finely pulverized charcoal, or lamp-black, (which is better, where it can be procured,) and tallow, mixed together over a moderate fire, with a small portion of tar to give it a proper consistence, will answer the purpose; and wool, which has been marked with such mixture, may easily be cleansed therefrom, by washing in strong soapsuds.

It is essential that a distinctive mark be given to

ewe and wether lambs; which is easily done by notching one ear of either; and the same method may be employed, with some variation, to class them at the future stages of their growth.

Where, indeed, a pure, as well as a mixed breed of sheep is reared on the same farm, it will become necessary, in order to avoid mistakes, to distinguish those of the first breed with a different mark from that employed for the sheep of the second. Were this system carried still further, and each sheep branded on the cheek with a separate number, a judicious breeder would find it conducive to his interest to keep a register, in which the numbers of each sheep might be marked; here also should be carefully entered such observations as not only related to the coupling and crossing of the breeds, but also those experiments he may wish to try upon the animals. A careful cultivator, who is solicitous to improve his art, will, in such register, notice the defects, or other qualities of his sheep, their respective states of health or disease, the nature of their wool, the profit they yield, &c. Thus it will be easy to ascertain what individuals it will be proper to dispose of every year, as well as those from which it will be advantageous to breed; and, at length, the object proposed will be obtained, namely, the improvement of the breeds, and deriving from them the greatest possible profit.

[To be continued.]

SELECTIONS OF EDITORIAL CORRESPONDENCE.

[The two following scraps reached us about the same time, from nearly the extremes of north and south. Such statements may be new in print—but unfortunately they are no novelty in publishers' correspondence. *We* could furnish a long list of such subscribers—and still we believe that we are so fortunate as to have the best paying list of any publisher in the United States, who has to confide in the honor of so many remote and unknown subscribers.]

From the Genesee Farmer.

Black list.

Many of our subscribers have expressed their approbation of the proposed publication of the names of such subscribers as refuse or neglect to pay for the papers, and we shall continue the list as occasion may require. The following names have been added to the list of delinquents during the present month:

P. Lencham, Winchester, Tenn.	$5 00
Dr. T. W. P. M'Gimpsey, Columbia Tenn. "gone to Mississippi,"	9 00
Oliver Harwood, Rushville, N. Y.—"does not wish it any longer,"	6 41
Caleb Vanduser, Macedon—"not taken,"	2 70
Abram Ramsdell, Macedon—"not taken,"	2 70
Daniel Murray, Kankakee, Illinois—"wishes it stopt,"	5 00
John T. Hill, Columbia, Mo.—"not taken,"	6 45
D. S. Rossiter, New Lebanon,—"gone to Illinois,"	1 40
Samuel Barrows, Esq. Olean—"refused"	1 60
Andrew Poucher, Smoky Hollow—"will take them no longer,"	1 60

From the Southern Planter.

The following is one among the many epistolary favors we receive; and which if not among the most important, yet forms an interesting portion of an editor's correspondence.

Villa-Rica, (Carrol co.) Aug. 11.

Dear Sir—You will do well to stop your paper directed to John D. Chapman, as he has moved away.

Yours &c.

JAMES L. ADAIR.

☞ Mr. Chapman owes for the Planter $7.50

ON THE DIFFERENT KINDS OF COTTON.

To the Editor of the Farmers' Register.

Fairfield District, S. C. Oct. 3, 1835.

The cotton plant forms a subject of peculiar interest, both to the southern planter and to the botanist: and every thing relating to its history and character cannot fail to excite a lively attention. The articles on this subject in your late valuable numbers, from Mr. Spalding and Mr. Croom, have been read with much pleasure, and we should be much gratified to see the investigation continued. Although these gentlemen have shed much light upon the native localities of this plant, the period and manner of its introduction into this country, and the botanical characters of the different species, yet, we apprehend, the subject is not yet thoroughly understood. Its botanical history especially—the several species, and the botanical characters of each, we shrewdly suspect are imperfectly known, and, consequently, the botanical descriptions are very unsatisfactory. Mr. Croom has given the characters of all the species of cotton, as furnished by the Encyclopædia of Plants. But upon examination, this botanical account is found to be imperfect. To render my remarks more clear and intelligible, I will beg leave to transcribe the botanical descriptions given by Mr. Croom from the Encyclopædia. According to this, there are but four species of the cotton plant, as follows:

"1. Gossypium herbaceum, (green seed cotton.) Leaves 5 lobed, 1 gland beneath: lobes round mucronate, invol. serrate, stem smooth."*

"2. G. hirsutum, (Mexican and petit gulf.) Upper leaves undivided cordate; lower 3-5 lobed, with 1 gland beneath: branches and petioles hirsute."

"3. G. barbadense, (sea island cotton?) Upper leaves 3 lobed; lower 5 lobed with 3 glands beneath: stem smoothish."

"4. G. arboreum, (tree cotton.) Leaves 5 lobed polenate; upper 3 lobed, with 1 gland beneath, Inv. tern. Cal. with 3 glands at base."

Eight or ten years ago I substituted what is called the Mexican cotton in the place of the green seed: and for the last three or four years I have purchased annually, as many bushels of what is sold in the Charleston market as petit gulf seed, as would furnish seed sufficient for the succeeding crop; so that my whole crop now con-

---

*Mr. Eaton in his Manual of Botany, describes the g. herbaceum as a biennial. Certainly not so in this country.

sists of what we consider the petit gulf kind, with, perhaps, some remaining plants of the kind introduced some years ago under the name of Mexican. Upon careful examination of my own crop, and those of many other gentlemen who plant the petit gulf seed, I find the botanical characters to be as follows.

Upper leaves 5 lobed; lobes acute mucronate: lower 3 lobed, lobes acute mucronate, 0 glands, stem, branches, petioles and peduncles hirsute. Perianth 3 leaved, gash-toothed.

Now it is manifest, that this description does not apply to either of the species above described by Mr. Croom. It does not apply to the g. hirsutum (Mexican or petit gulf,) because, although it is hirsute, yet the upper leaves are not undivided cordate, but 5 lobed acuminate mucronate, whilst the lower leaves are 3 lobed, and not 3-5 lobed with 1 gland beneath.

It is equally manifest, that the description of what we plant as petit gulf, does not apply to either of the other three species. Is the kind, then, which we plant as petit gulf cotton, a fifth species? Or is it a hybrid? Be this as it may, we have found it so superior in point of productiveness, to the green seed, and it has so entirely superseded the latter, that I have not been able to find a single plant of the green seed kind growing in the neighborhood, with which to make a comparison as to its botanical characters.

That the plant which we cultivate as the Mexican, and that which we cultivate as the petit gulf is one and the same species, is manifest enough. The only difference we can detect is in the bearing and productiveness. Owing, perhaps, to its being a variety, or perhaps to the seed being fresh from the Mississippi, the petit gulf kind is earlier and more productive, at any rate for two or three years, than any kind we have ever yet planted.

Upon the whole, what are we to make of the description of the g. hirsutum, given by Mr. C. as the Mexican or petit gulf, from the Encyclopædia of Plants? We plant no cotton of this description, I think, in this state. Of course, the question arises, have we been deceived in the seed imported as the petit gulf seed—or have the botanists been mistaken in their description of it? A further examination of the subject is worthy of the attention of botanists; and I would hope ere long to see the several species of cotton settled with as much precision as those of any other plant. This, I am sure you will perceive, is not a mere idle curiosity. The practical utility to the planter of being able to determine the species with certainty by a view of the growing plant, will strike you at once, as very important in several respects. And the botanist who may reduce the subject to accuracy and certainty, will not only render a valuable contribution to the science of botany, but he will confer an important favor upon cotton planters, and deserve well of his country.

JAS. DAVIS.

A LARGE YIELD OF CORN.

To the Editor of the Farmers' Register.

White Plains, Norfolk County, Oct. 21st, 1835.

I now send you, according to promise in my last, (dated the 6th of July,) the result of the experiment crop—not that the crop is of an extraordinary character, so as to deserve public record; but as the promise had been given, silence would have countenanced the impression, that it had resulted in a total failure—which was not the case. The quantity housed and measured was 115 bushels and five quarts per acre. There was a loss of many bushels by the uninterrupted depredations of my poultry, as it was planted not far from my poultry yard, and a heavy wind in July had prostrated the whole crop, so as to make it entirely convenient to their ravages—besides, the quantity that was lost by rotting and ruining on the ground, and the blight the corn received in so young a stage, by having the roots broken at the time it most needed them for maturity. Could I have been on the farm during the fall, the crop might have been saved from these domestic pilferers; but my health prevented. I only returned in time to witness its blight. The manure used was stable and ashes.

A. S. FOREMAN.

P. S. The corn planted was the Twin corn, obtained from James M. Garnett, Esq. of Essex.

Extract from the Worcester Sentinel.

IMPORTANCE OF LIME TO THE LOWER EASTERN SHORE COUNTIES.

* * * * *

Beds of marl, which are effecting such wonders in particular and extensive sections of Maryland and Virginia—it seems, from the opinions of practical geologists, are not to bless, with their treasures, that portion of the peninsula immediately bordering on the sea board; but provident nature has not left it destitute of a cheap, and efficient substitute. The shoals of shells in our bay accessible at low water, and in many places abundant, and the supplies derived from living shell fish, brought up for domestic consumption, will afford the material for lime, during many successive years. The time is not distant, perhaps, when stone lime will be burnt upon this shore, where wood is cheap and abundant, and labor low, from the lime stone imported by return vessels from the Delaware, as has been lately practised with success, in the neighborhood of of Smyrna; and will soon go into operation, at the head of Indian River, where shells cannot be procured, in sufficient quantities,for agricultural purposes. Unexpected beds of fossil shells may yet be discovered, along the sea coast, by the persevering and scientific exertions of professor Ducatel: the accurate and learned gentleman, employed in a geological survey of Maryland; a measure which reflects so much honor upon the wisdom and public spirit of your legislature; from which the happiest results have already been realized, and more extensive benefits may be justly anticipated.

The assertion will be sustained, by all the intelligent citizens of the Eastern Shore of Maryland and Virginia, at all conversant with agriculture, that a soil more susceptible of rapid and easy improvement than ours—more grateful in its returns to the hand of judicious labor, and more convenient and pleasant in its tillage, does not exist upon the face of the globe. A system of culture deplorably erroneous and exhausting, has been pursued for ages, which would have reduced to a

state of abject sterility any other soil, in half the time. The active exertions of a few influential and enterprising individuals in each county, establishing agricultural societies as is the case in every county in the state of New York; exciting a spirit for extensive reading, of approved works upon husbandry; encouraging a judicious rotation of crops upon every farm, however small, of the three or four shift system; with the cultivation of clover, as soon as the state of the soil will justify it—recommending to all, the advantage of abstaining from grazing their fields—and above all, by introducing the judicious use of lime, or marl, in the way suggested in the *Essay on Calcareous Manures*, would in a few years, effect an astonishing change upon the appearance of our fields—and by inspiring the industrious cultivators of the soil, with the sure expectation of having their care and their toil rewarded with plenty, for themselves and their children, would restrain at once the emigration to the west, which is threatening to depopulate the Atlantic sections of the peninsula.

A late extensive tour through the northern settlements of Philadelphia county, where lime is universally used, and in immense quantities, and with effects upon the productions of the earth, so wonderful; has convinced the writer of this article, that nothing is wanting to the lands of the Eastern Shore of Maryland and Virginia, with the qualities of which he is well acquainted, but the adoption of a similar course of improvement and tillage, to render them equally fertile and productive. In many situations here, marl can be procured at a small expense; in all shell, or stone lime, at a cost inferior to that which is paid by farmers remote from lime-stone quarries in many parts of Pennsylvania.

* * * * *

T HOLMES.

ON THE SCORZONERA HISPANICA (VIPER'S GRASS,) AS FOOD FOR SILKWORMS.

By M. Poirel.—Published by order of the *Horticultural Society of Lille.*

Extract, translated for the Farmers' Register, from the *Journal d'Agriculture, etc. des Pas-Bas.*

I have found in the *Annales* of the Horticultural Society of Paris, of November 1829, many assertions which, for the interest of our department, it seems to me to be necessary to be answered, in order to prevent the injurious influence which they might have on a subject of the first importance for us in the north of France, that of feeding silkworms on the black-rooted scorzonera—(*scorzonera hispanica*, or garden viper's grass.)

First in order, in the report of the proceedings of the council of administration of the Society, I have remarked the following passage:

"The Count de Murinais, communicates a note relative to the success of raising silkworms fed on the leaves of scorzonera, in the north of France, by an inhabitant of Lille. After a discussion upon this communication, in which many members, *without contesting the fact*, maintain the *impossibility* of obtaining advantageous results from silkworms fed with scorzonera, the council sends the note to the committee of publication, authorising it to add any observations that the committee shall judge proper."

They do not contest the possibility of raising silkworms by feeding them exclusively on the leaves of scorzonera, because indeed the evidence cannot be refused; they only deny that it is possible to obtain by this means, satisfactory results. Here, however, the evidence is not less strong, since it is notorious that crops of silkworms, fed on this substitute, were tested at Lille in 1828 and 1829; that samples of the silk obtained were exhibited at the Cabinet of Natural History of that city, where every one could appreciate their beauty, which was not below that of the finest silks of the South of France. As to the quality, the merchants of Lyons passed on it a sufficient eulogy, in offering 24 francs the half kilogramme for a considerable quantity, if it could have been furnished. They would have offered one franc and fifty centimes more, but for the imperfection of the winding, occasioned by the want of suitable reels.

The value of the product being established, there is nothing left to answer, but the reproaches directed against scorzonera. I find them at page 291, in the report made in the name of a special commission, by M. Loiseleur Deslongchamps, upon a nursery of white mulberries formed by M. Combet, at Fonteroy-sous-Bois. This is what the reporter says:

"In the laudable desire of seeing augmented the product of our indigenous silks, some persons *believing preposterously* that the principal difficulty existed only in the impossibility of procuring enough nourishment for the worms, have sought to find substitutes for the mulberry. But these persons *have not comprehended* that the substitutes, supposing them to be found, would hardly present the same advantages as the mulberry. In effect, those who have proposed the scorzonera, *have not seen* that this plant, (supposing even that it could produce a silk as good and as beautiful as that of the mulberry, which it is difficult to believe,) would furnish much less of leaves upon a given surface, than the mulberry; that it is a biennial plant, and that every two years it would be necessary to make new sowings, and that the crop would be subject to many more casualties than the mulberry, which when once planted, may last a century or more."

The persons who have proposed to raise silkworms in the north of France by means of the black-rooted scorzonera, have not done so as lightly as the expressions of the report would induce to be believed. These persons knew that the mulberry is not hurt by the most rigorous of our frosts, so long as, yielding to the influence of the climate, it remains without vegetating. But they also know as well, that the leaves, when once opened, may be destroyed, even in the most southern part of France, by late frosts. When this accident occurs in the midst of the rearing of the silkworms, there is no resource but to lose them, without being able to replace them when new leaves come out—either because there were no more eggs, or because that the heat of the season had hatched them spontaneously. It is then the fear of an entire failure of the food of these insects, and the hope of diminishing the expense of their rearing, which have induced the seeking for substitutes for the mulberry. The matter in question is no longer the possibility of finding a substitute—that is answered affirmatively and decisively by the results above stated. Neither is it

even permitted to doubt as to the beauty and goodness of the silk obtained. The dealers to whom it was presented judged it without prejudice, since they were ignorant of its origin; and the price which they were willing to put on it, indicates sufficiently their favorable opinion of the quality.

The only point which remains to examine, and which is not the least essential, is to know if raising silkworms by this substitute, presents as much advantage as their being raised by the leaves of the white mulberry. It is objected—

1st. That upon a given surface, the scorzonera will not furnish as many leaves as the mulberry—

2nd. That the scorzonera is a biennial plant, of which the crops will be subject to many more casualties than those of the mulberry.

No comparative experiments having yet been made, nothing can be affirmed as to the relative quantity of leaves which a certain space would yield. It would also be necessary to examine whether if, with equal weights of leaves, the mulberry would not feed a greater number of insects than the scorzonera. Thus it may be seen that I go in advance of the objections—for this latter point has not been made.

Without wishing here to cut short the question, and knowing the insufficiency of my *data*, I limit myself to saying, that the scorzonera is not an annual plant, but a perennial, which lasts six years or more: that its culture is very easy, and within the reach of all persons: that our lands suit it perfectly, which is not the case with the mulberry: that the crop of its leaves is sheltered from all irregularities of weather, not excepting late frosts—so that one may commence the hatching of silkworms by the month of March, long before leaves of the mulberry can be had:* that we can, without inconvenience, take many cuttings of leaves from the scorzonera, commencing with the month of March on the sowing of the preceding autumn, and from the beginning of June of the sowing of March. Thus no delay will be experienced by those who desire to begin silk culture, and consequently, a new advantage is presented over the mulberry, which, admitting the mode of its cultivation to be the most favorable, requires not less than five years of respite before permitting a first gathering of leaves: even for that, it is necessary that the ground and the climate shall be proper for its developement.

Another advantage that the scorzonera offers is the usefulness of its root, as a culinary vegetable, during the two first years, and the excellent winter food which it furnishes to cattle when its greater age, and consequent degeneracy, forbid its admission to the table. It is then not likely that any one will think of continuing the same crop beyond the third year, unless for the purpose of obtaining a greater quantity of leaves.

If all these considerations are maturely weighed, it seems to me impossible that any one should determine to give an entire preference to the mulberry, and to give up the scorzonera, by adopting the opinion of M. Loiseleur Deslongchamps which rejects it positively, in the name of the commission of which he is the organ, and in these terms, page 292:

"To what good purpose, besides, to seek to substitute the mulberry by plants, which reason ought to tell us do not equal it in quality?"

And how will it be proved, especially by reasoning, that the leaves of the scorzonera are not in our latitude, as good nourishment for silkworms as those of the mulberry? Since the silk which we have made yields in no respect to that of the south of France, would it not be necessary, in the first place, to prove that the mulberry transplanted to the north, preserves all the qualities which it had in the south?—and who will venture to undertake to maintain such an argument, against all probability? I leave it to the care of those who will not fear to place themselves in opposition to the laws of the creative power, which, in the harmony of the universe, has wisely fixed each plant under the climate most suitable to its perfection.

I do not think that it will suit to substitute the mulberry entirely by any plant whatever—particularly where that tree fulfils the object proposed in the rearing of silkworms. But it was desired to make known to those whom it might interest, that they might, in certain cases, derive a powerful aid from the scorzonera—and to prove that, by its employment, we may hope to enrich the north of France with a new branch of commerce in much less time, and with more chances of success, than in limiting ourselves to the resources which the mulberry presents. * * *

[If the scorzonera deserves the recommendation given above, as food for silkworms, in a country where that branch of industry has made great progress, and where mulberry plantations are common, it will be far more valuable as a substitute in the commencement of the business, where years must elapse before mulberry leaves can be obtained from young plants. The substitute would not only (as in the north of France,) be useful during transient and unusual times of scarcity, caused by the destruction of the mulberry leaves by late frosts, but while our mulberry nurseries are forming, and before yielding their first crops. The remarks which we submitted in our last No. respecting the use of the black or native mulberry leaves, are still more applicable to the scorzonera; as this plant may be produced in abundance in a single season, where no mulberry leaves can be obtained. We are far from believing that this, or any other plant, can furnish food for silkworms as profitably as the mulberry tree: but if (as is stated by our author,) the cocoons produced from the scorzonera are of equally good quality, it is a matter of very little importance to the new silk culturist whether an acre of land may be the most profitable in the one plant, or the other, when both are in perfection. He might learn the proper management, and get over the inevitable errors and losses of a new beginner while using scorzonera as food, and before his mulberry trees were old enough to furnish leaves. From the proofs adduced, there would seem to have been no doubt of what the author asserted of the value of this new food for silkworms; but it must be confessed that there is a reason for supposing that objections have since been found, from the silence on the subject since 1830. We have met with nothing for, or

*The writer refers to the north of France. Ed. Farm. Reg.

against the use of scorzonera, since that time, which was the date of this publication.

We know not whether the scorzonera hispanica is raised in this country as a garden vegetable, though certainly nothing in our climate forbids, judging by the regions in Europe in which it grows. It is a culinary vegetable—perennial, herbaceous—a native of Spain, and long cultivated in England. (*Encyclopædia of Plants.*) The root is carrot-shaped—is cultivated like salsify or carrots, and is eaten boiled like carrots or parsnips. The bitter flavor of the rind requires that the roots should be first scraped, and soaked in water. (*Idem*—also, *Kenrick's Orchardist, 2nd Ed. p.* 365.) Rozier calls it "a species of salsify. The flowers are "yellow and the leaves toothed—the root, black on the "outside, is white within. In the middle and north of "France, this root is not eaten but in the second year: "it occupies the ground then longer that salsify, and "in that respect, its culture is less economical; howe-"ver, the root of the scorzonera is generally preferred "to that of the salsify, as more tender and delicate." —(*Cours Complet etc.*, Vol. VI. Scorsonere.) Ed. Farm. Reg.

RAKING AN INVALUABLE REMEDY IN COLIC, &c. WITH HORSES.

To the Editor of the Farmers' Register.

Though this communication would more properly belong to the *Farrier*, yet it will not be amiss, I fancy, to offer it to the farmers through the medium of your truly useful and valuable periodical.

Raking is an operation, which in several cases under my own immediate observation, has been found really "an invaluable remedy in cases of the colic, constipation of the bowels, &c. &c., in horses."

Whenever the horse shall become affected with the above specified complaints, it is common to administer a purgative of some kind: if this should fail to produce the desired effect, the *inexperienced groom* administers another and another until the sufferer dies—merely for the want of a passage from the bowels.

Now *raking*—though an indecent operation—I venture the assertion, in ninety-nine cases of the hundred, will attain the desired end—viz: *an evacuation from the bowels.*

I will, for the information of those unacquainted with the *modus operandi*, describe the manner in which it should be performed.

Place the horse in a situation to prevent him from doing injury to the operator by kicking, and push the hand into the abdomen, until a hard lump of the fœces is felt—(here, by the way, I will observe, that this hard lump is the cause of the suffering to the animal—) push the hand backwards and forwards, until the lump is removed.

It is not unfrequently the case, that this operation should be performed several times; but I will hazard the assertion, that an evacution of the fœces will be obtained in *every* case in which the above-mentioned directions are followed. It is scarcely necessary to remark, that there will be no occasion for this operation, should there be no inability on the part of the animal to void his fœces.

A HORSE DOCTOR.

Oct. 20*th*, 1835.

ON THE CHOICE OF SOILS FOR APPLYING PUTRESCENT MANURES.

To the Editor of the Farmers' Register.

A writer in a late No. of the Register doubts whether or not it is more expedient to apply manures to a soil of a good quality, or to that which is inferior. The author of "British Husbandry," in the Farmer's Series of the Library of Useful Knowledge, says, on this subject—

"There is, indeed, evidently a mistaken practice throughout most parts of the kingdom with respect to the application of manure. The custom alluded to, is, that of laying it upon land of inferior quality—while that of a superior kind is in equal want of improvement; the better part of many farms being thus in some degree impoverished by attempting to improve, at an evident loss, the poorer parts. Others, indeed, follow the opposite system; but, when justice is done to the land, every part in rotation, should receive the manure arising from its produce. There are, however, some rare instances of ground of so rich a quality, that by laying any manure upon it an injury would be sustained. But upon the whole, it is an evident fact, that any manure whatever—if not of a nature unsuitable to the soil—will be always attended with a proportionately better return when laid upon good, than upon poor land."

The above view must strike with peculiar force those who observe, in Virginia, even under the most judicious management, "the better part of many farms impoverished by attempting to improve the poorer parts."

It is with us, almost universally the practice, to bestow our putrescent manures upon the poorest spots with the hope of raising them to an equal degree of fertility with the rest. Is this hope ever realized? Is it not frequently the case, that equal sterility, rather than equal fertility, is thus attained? It would seem more wise, to fertilize by the application of our manures, the acre which has produced five barrels of corn, so as to make it produce ten barrels, rather than to cover the barren land with the same quantity of manure, which would not produce more than three or four barrels, under the most favorable circumstances, and with double labor. Where our fields are chequered, as they too often are, with these poor spots, there we might apply calcareous manures with most advantage, whilst we applied the putrescent to good land to make it still more productive.

I offer these hints with diffidence. I hope that a better farmer than myself will give light to your readers upon this subject.

E. T. T.

Nov. 3, 1835.

Queries. Is it not better to *improve* fifty acres of land so as to produce ten barrels of corn per acre, than to cultivate one hundred acres which will produce five barrels per acre? Is it not a common error with our Virginia farmers—our attempting to cultivate *too much* land? Ought we not to enrich half the quantity of land we are in the habit of cultivating, and to till it well—or

ought we to add to our fields year after year what new land we can clear, putting our farm-yard manures upon the *galls* and poor places?

Will *meadows* sown in *timothy* and *herds grass* in August last, be improved by a dressing of plaster of Paris next spring? A serious answer to this query will oblige

E. T. T.

For the Farmers' Register.

REASONING OF BRUTES. ANECDOTES OF CATS.

There has been much idle discussion on the question whether other animals besides man exercise reasoning powers, or are always guided by instinct. Although this is one of the many subjects on which "much may be said on both sides," it has always seemed to me clear that all animals (man included,) possess and exercise both these powers, in greater or less proportion—the more perfect animals, as man, and the elephant, and the dog, having most reason and least instinct; and the lower orders, as insects, possessing the most admirable instinct, and the least of reason. Still man has some instinct, and the ant exhibits still more evidence of having some share of the reasoning faculty.

Domestic animals, by ages of servitude to, and companionship with man, have not only departed greatly, as to each family, from their original wild character, but many individuals seem to have learned more than others, and to exhibit feelings, as well as acquirements, different from all others of their kinds. Many well attested and interesting accounts have been published of such facts of elephants and of dogs, the animals which can best profit by man's teaching, and even seem to share his passions and feelings. I shall state a circumstance of another, and the least tamed and docile of all domestic animals, the cat, which exhibits every appearance of the possession of not only reasoning, but of feeling. The circumstances were witnessed by all the members of a highly respectable family in my neighborhood, by several of whom I have heard them stated—and in such manner as to leave no possible doubt of the correctness of the details which will be here repeated.

A female cat that was nursing her litter of kittens in the cellar of the mansion house, died when they were so young, that in most such cases it would have been deemed a more merciful plan to drown them, than to attempt to raise them. But as cats were then scarce about the house, and the rats and mice very numerous and destructive, orders were given to use every care to nurse and raise the young kittens. The cellar in which they were, was generally open, being partly a kind of lumber room, and frequented continually by the servants in their different occupations.

Writers on natural history have treated the cat as devoid of all affection or kindly feelings for its owner, and indeed for every thing else but *self*—that caring for nothing but what conduced to its own comfort or pleasure, the cat was a complete exemplification of a being altogether selfish. Such is truly their almost universal character. In addition, we know that however tame cats become in the houses where they live, they still remain as wild animals at others, and in the presence of strangers—going abroad by stealth, and at night—and flying in alarm from the approach of every footstep. The cats raised in our negro-houses, are very fearful of approaching the "great house," and rarely venture to do so except at night, and when attracted by the company of their own species.

At one of the negro's houses, about 100 yards distant from the mansion, another cat had kittens of about the same age of those left by the one that died. This one, as usual, had never been seen at the house, and probably had never ventured there except in their customary roaming at night. The next day after the death, this "quarter cat" was seen carrying off one of the orphan kittens, in her mouth. She was chased, the kitten taken from her and brought back. It was not long before she returned, and repeated the attempt, but with the same ill success as before. She had to pass through a considerable distance exposed to detection, and could not, without being seen, escape with her burdens. The report of these attempted abductions, and the singularity of the circumstances, caused the family to attend with curiosity to her proceedings, and left the poor animal the less chance of success. She continued however, for several days, (the door of the cellar being then always open) to carry away the kittens, without being able to escape, undetected, a single time. At last a new and more interesting movement was seen. She was bringing one of her own kittens to the cellar—and being left undisturbed, she soon brought them all, and placed them with those which she was so anxious to nurse. There she took her place in spite of her fears, and nursed both litters as long as they needed it. Of course she, and all her charge, had every aid of food, and care from the ladies of the family.

Another anecdote of a reasoning cat will be stated which was told me by an intimate and valued friend, whose habits of observation are remarkable for strictness and care, as are his statements of every kind for the most entire correctness. He had a cat raised in his house, and as tame as usual under those circumstances. But whenever about to produce her young, she would take refuge in some out-house, not inhabited. There she kept her kittens until they were old enough to begin to eat—and then with every litter her course was always to bring them one by one, (held according to their mode of transporting them, by the skin of the back,) and lay them on the hearth rug in her mistress' chamber. For experiment, they were sometimes taken up and carried back, and more than once in the same instance. But she would patiently repeat her labor, and continue to bring them and lay them on the rug, until they were permitted to remain, and were fed and taken care of. This cat was a bad nurse, and generally lost some of her kittens, even with the aid thus obtained. No words could have been used to express more strongly than her conduct, the prayer to aid her in her maternal duties.

E. R.

EFFECT OF BONE MANURE ON CORN.

To the Editor of the Farmers' Register.

Brookfield, (Henrico) Nov. 6, 1835.

In a number of the last volume of your Register, a correspondent describes an experiment made

by the application of bones as a manure for corn, the result of which, as reported, seemed to prove that corn derived very little benefit from their application. From long experience in the use of bones as a manure, and a knowledge of their highly fertilizing properties, I was induced to make a similar experiment on a small scale. During the last winter, I got the negroes on the plantation, for a small premium, to collect at their own convenience, a quantity of bones from around the neighborhood, and during wet or stormy weather, had them broke in a wooden trough with pestles shod with iron, into as small pieces as my time would permit, a small proportion of them being reduced to a powder. At the time of planting the corn, I selected four rows, forming an intermediate space between ground well manured from the winter farm pen, and ground not manured. On these selected rows, I applied the bones thus pounded, depositing a small quantity of the bones previous to planting the corn in each hill, afterwards dropping the corn, and covering the whole with the hoe, not deeper than any other part of the crop. At a very early stage of the growth of the corn, it exhibited a superiority over that growing on either side, and maintained that appearance throughout the whole of the season, the difference being discernible at a distance. There were two stalks cultivated in the hill, at five and a half by three feet, the greater proportion of the stalks producing two good ears. Throughout the whole of the season it maintained a vigorous and rapid growth, and when the corn on both sides of these rows exhibited evident symptoms of having suffered injury from a short drought, the corn on these rows was apparently uninjured. In cutting and clearing off the corn, preparatory to seeding wheat, much of the general crop was very imperfectly matured, while the corn raised on the bone manure presented a much smaller proportion of imperfect ears. Circumstances prevented me, as I had intended, from ascertaining the exact difference of produce—but gentlemen who were competent judges, estimated that the produce from these four rows would exceed the produce from an equal number of hills from the farm pen manured land, by at least one-third, and more than double that of the land which had received no manure. From the result of this experiment, I am satisfied that bones are a valuable manure for corn, if applied even in very small quantities. The expense of them would be small, and they are much easier pounded, when performed as above stated, than gypsum, and the expense of collecting and hauling is very trifling. On every farm there are a greater or less quantity of bones scattered about, and in the vicinity of every village or city, they are deposited in large quantities, presenting any thing but an agreeable or pleasing appearance, reminding the passenger at every step that he is, as it were, in the midst of a charnel house. How much better would it certainly be that the tiller of the soil should enjoy the full benefit of their enriching qualities, and that these animal remains which now present nothing but a loathsome spectacle, should be employed to beautify and fertilize the soil which once afforded them subsistence, and instead of presenting an eye-sore to their late masters, be to them a source of profit?

I regret that circumstances so occurred as to prevent me from having it in my power to present you with more practical results, than are above stated. As it is, I hope it may induce some one of your readers to bestow some attention on a means of improving their exhausted farms, within the reach of almost every farmer. I anticipate that the benefit which the wheat crop may receive from the application of the bones, will be as decided as has been that of these four rows of corn.

A. NICOL.

DESULTORY OBSERVATIONS ON THE IMPROVEMENT OF VIRGINIA. SILK CULTURE—MARLING—FEMALE LABOR.

To the Editor of the Farmers' Register.

Moor's Mount, Nov. 4, 1835.

I have just now received your November number, and coursed over its pages. It had been my intention to make a communication for your useful work about this period, and your complaint in this last number of the falling off in the contributions detailing practical results, decides my mind to write you forthwith, to present some few practical results, proceeding from a few of my humble operations, upon an estate lying on the banks of the Rappahannock, which has, under the corn and wheat rotation of cropping, after seven years' experience, proved so unprofitable in comparison with cotton planting at the south, that for several years back, I have sought more lucrative employment for part of my slaves, on a Florida plantation. It is true, by the use of clover and plaster, and a slight *nibbling* at a marl bank, I have put a new face upon the land—luxuriant clover greeting the eye, (and after August the mouths of my stock,) in place of hen grass and life-everlasting. This practical result, valuable to the country, has in labor and money, cost me, we may say, the full price of the "Indian's gun," and but for its being encountered upon a most desirable homestead, would have been, in comparison with the application of labor and investment of capital in many other situations in the south and west, very injudicious management. For had my circumstances confined my dependence for income to meet the expenses of living, to the profits of this farm, I should have been reduced to a most rigid parsimony, to have "made buckle and tongue meet," although I have worked from 12 to 15 hands. Wheat has been my market crop, and so general has been the destruction by the fly, that five hundred bushels has been about the average crop, from 100 acres sown. But for the ravages of this unrestrainable, irresistible pest, I am confident my fields since taken with clover, would produce 1000 for market, which at one dollar per bushel, would give a yield equal to 6 per cent. upon the capital, with progressive improvement by continuance of clover and plaster, and more spirited resort to my marl banks, which have been much neglected in consequence of having several hundred acres to clear up, in order to get regular fields, and a partial reclaiming of a piece of marsh rendered valuable meadow, instead of a nuisance, which produced much fever both at home and in the family of a near neighbor. With six per cent. produced annually, progressive improvement, and increased value of slaves, a reasonable man should be content to enjoy life with his relatives, and friends of his youth, without being allured by an insatiable

avarice, to turn his back upon the home of his nativity, with all its endearments, to plunge into the forest with all its privations, and dangers of acclimation. But this infernal pest, the Hessian fly, (and a curse on the memory of George III. and the German prince, who sent them with the cut-throat band of mercenaries,) presents the only bar to the Virginia farmers clearing 6 per cent. and by curtailing his principal auxiliary, and main market crop, in a large portion of the state, reduces his profits to three per cent. and perhaps less than that. Hence, with the increased facilities of emigration to the cheap rich government lands of the south and west, a constant overflowing stream of population and wealth, has flown from the Old Dominion. And for the last ten years, since the policy of the federal government has been to force off the public lands at the minimum of $1.25 per acre, and more especially, since the high price of cotton, this exhaustion of our wealth and population, has been fearfully accelerated. Men will not forego the prospect of doubling their fortunes by a travel with their families some eight or nine hundred miles, and delve on through life, struggling with the disadvantages of farming at a profit of 3 per cent. when, by the change, a prospect so much more cheering is displayed. These observations apply to the proprietors of the country; but how much more forcibly do they apply to the larger class comprising tenants, overseers, mechanics, or to use a northern and European phrase, which by the way I do not admire, the "working men" of the country. These are part of the bone and sinew of a country, and their loss is irreparable. The home-loving Virginian mourns their departure, and alas! how often has he done it for several years past, while family after family, and scores of young men have swung from their native moorings, to people and enrich Alabama, Mississippi, Louisiana, West Tennessee, Missouri, Illinois, Indiana, Florida, Arkansas, and even Kentucky and Ohio; yet after, they have become themselves hives to send out their swarms.

It is a sad and gloomy thought for us who will cling to our mother's bosom, and die with her ancient flag over us, that she is so retarded in her progress in the race with her sisters of the union; and patriotism—Virginia patriotism, restive at the sight, naturally casts about for some means of alleviation, and some grounds for consolation. I think it is obvious, that if a new direction to labor in a considerable degree, could be given for producing more certain staples than wheat, and less scourging than tobacco, in which female and juvenile labor would be more generally and lucratively employed, that we might anticipate the happiest results. Regarding the absolute unprofitableness of female labor, as well as of boys and girls, black and white, in Virginia, and the oppressive legislation of congress, as rendering all supplies not raised at home dear, in comparison with the prices of our staples, coupled with the ravages of the Hessian fly on wheat, as the principal causes of Virginians being driven into exile, I have anxiously sought for means of relief. As a Virginia patriot (and when I cease to be one, sectional as may be the feeling, it will be time for me to emigrate,) I have deemed it a sacred duty to endeavor to sustain her in her untoward situation, and trust I have contributed my humble mite in coming to the rescue, although I have located an interest far beyond her borders.

Although I regard the above three causes of Virginia's depression as having been mainly operative, yet the first, I think, has certainly been most so of the three; and since the second, by the arrest of the unjust and unconstitutional protective tariff (thanks to gallant South Carolina,) and the approaching termination of the supply of rich government lands, will be greatly reduced in its operation upon us; and the last is regarded by me as hopeless of cure, my attention has been mostly directed against the first evil. Female and juvenile labor consumes more than half in every community, and of how little avail is their labor in Virginia for raising corn, wheat, and tobacco, which are the three only staples! Her mining, fishing, mercantile and grazing interests yield hardly any employment to them. Hence they rest as an incubus on our productive labor, instead of sustaining themselves, and even adding to the income, as is the case to the north. There, a father's income increases from the joint labor of his sons and daughters, as they are raising—and this is the case in a cotton growing country like the south and south-west; while here, the more children, the more indigent the family. And with the slave holder, if his slaves breed rapidly, he will be found in arrear in a few years, and to square himself from debt, must pick a quarrel with one or two, in order to screw his and his wife's feelings up to the selling point, to prevent the sheriff from seizing some one that may be dearer to them. In the non-slave-holding, states every species of manufacture has been introduced, under the fostering stimulus of federal protection, and the energetic enterprize of an industrious people. I have travelled amongst them principally with a view of discovering some plan for the improvement of the condition of our poor and laboring classes, and for deciding whether it is not possible to turn the oppressive incubus upon male labor, in the unprofitableness and want of employment of female and juvenile labor, into an active auxiliary source of support, and even of income.

The result of my observations and reflections is, that capitalists should, as they doubtless can with safety and profit, embark in manufactures to a ten-fold extent. Our streams present cheap propelling power. These factories would afford much remunerative employment to women, boys, and girls, both black and white, and render us less dependent on the north, whose apathy in suppressing our most cruel foes, the impertinent incendiary abolitionists, admonishes us to lessen our intercourse with them, and seek more independence of their supplies, by raising them at home, on better terms—especially such, the production of which affords lucrative employment to females and youths of both sexes. Our land holders, I think, should try to supersede wheat, except on the highly improved lots, by mingling the culture of the mulberry (the Chinese) and introduce the raising of raw silk for manufactures, which would doubtless spring up in a silk raising country. This branch of industry now being introduced in the less genial region of New England and New York, will, if introduced into Virginia, afford the greatest and most beneficial and suitable employment for our unproductive classes. The raising of the orchard—feeding of the worms—managing

the cocoons and eggs—reeling the silk—all admit of women, boys and girls; the two last at an age when their labor is for most other purposes, utterly inefficient. The reeling process can proceed during the winter months, which is a great consideration. That our soil and climate is better adapted to the mulberry than farther north, I think highly probable; and our summer and fall are long enough for two crops of cocoons to be raised to equal advantage. The leaf is sufficiently unfolded by the middle of May to begin to feed, and by the 20th of June the first crop will stop feeding, and by the 1st of July the crop of cocoons will be cleared off. While they are being prepared for the filatures, the second crop of eggs will be ready to hatch, and the 1st of August, or perhaps the middle would be the best, the second plucking of leaves would commence, so that about the 20th September, all feeding would close. The Chinese mulberry trees, and even my white Italian, have barely cast the leaf. Now, therefore, no apprehension could arise upon the score of early frosts, as September gave us tobacco killing frosts, without touching these mulberry leaves. I am so much encouraged from my personal observations at the largest cocoonery in the United States, (Mr. Whitmarsh's in Northampton, Massachusetts,) that I am preparing to go in for an orchard of 15 acres, and accommodations for five millions of worms, which upon the two-crop system, as contemplated, will admit of doubling, and of course, requiring an addition of five or ten more acres to the orchard, in order to have an abundant supply. On getting my establishment in full operation, I count upon giving employment, of a lucrative character, not only to my own women and young slaves, but to many of the neighboring poor people, and to hire of some of my large slave holding neighbors their negro chaps in leaf-gathering time, at a price that will render them better than mere consumers.

I am happy to find that I shall not grope my way alone in this enterprise, as your correspondent Mr. J. B. Gray, over the river above me, says he is going largely into the business. He has the means and youthful energy for the laudable undertaking, and every patriot should bid him "God speed." Eastern Virginia is not a country fit for grazing to advantage, in comparison with the western or northern states. And the south has the rich staple of cotton, and the far south, sugar. We must call in new articles, better suited to the country than small grain or grass, and with the culture of silk, madder, broom corn, and wheat, on rich lots, combined with our best staple, Indian corn—the encouragement of home manufacturing establishments, especially such as will afford females and children lucrative employment, I think with these improvements the day would be hastened greatly, when the tides of emigration would cease to flow, and the Old Dominion begin to raise her venerated head once more. The mother of states must not become a howling wilderness. The land of the most illustrious of American heroes, sages and statesmen, should not be cast in the shade. It is not because of negro slavery that she pines, as is ignorantly charged by the fanatical abolitionist, and even the philanthropic colonizationist, but from the causes which I have adverted to in the preceding part of this desultory communication. A bare reference to the annual supplies of emigrants, and attendant wealth, all lost to her, will suffice to refute this idea. Let this sluice be shut, and the plan of giving lucrative employment to females and the youths of both sexes, and a few years will prove the fallacy of this argument against slavery, which is upon the tongue of every whip-stitch politician, and northern and southern abolitionist and colonizationist.

Before leaving this topic, I must express my thanks to your enlightened and philanthropic correspondent, "Polecon," as he subscribes himself, for his able communications touching the low wages of women. I feel a natural sympathy with him, because his mind has been running with mine upon this interesting subject. I trust his strong pen is not laid aside, and that we shall hear from him again, and that under his own name. Such a writer has no cause to withhold his name from the public, and I am sure his manly and just remarks upon the trade of tailoring, as engrossed by our sex to the injury of women's prospects, if they gained him the growl of one knight of the thimble, would bring, as a set-off, the grateful smiles of a host of fair seamstresses that are held in subordinate dependence by the ungallant and selfish encroachment upon the proper sphere of woman. I will not shrink from uttering a suggestion here, that occurs to my mind, as an additional means of restoring this branch of industry to the sex to which it appropriately belongs, and that is, for the associations your correspondent recommends in behalf of female labor, to have an auxiliary, in resolutions on our part, to give a preference to female tailors, in all cases, and female associations, to place male tailors in a state of "Coventry," in reference to social intercourse, and even the important article of marriage. I wish the worthy fraternity no harm, because I wish them to follow a manly employment, not invasive of female rights and duties.

I have, you see, wandered away from the promised detail of a few practical results, into this interesting field of mingled observation and speculation, with hardly a spice of practical experience intermingled. I alluded once or twice to marling, which is a favorite theme with you, and I will now proceed to state my observations upon the results of a slight essay at it, made about seven years ago. It was with blue marl, which abounds in this region, with thin layers of shells of various kinds interposed—the blue, where no appearance of shell, retaining the shapes left by them. They have been decomposed, and I think, in the process, formed sulphur, copperas, plaster of Paris, or gypsum, and perhaps other elements which may be detected by a strict and accurate analysis. Certain it is, that the blue marl, as we call it here, is a valuable improver of land. It acts as lime, in rendering the soil more permeable and easier to work, destroying weeds, and causing hen-grass and broom-sedge to vanish, to make room for white clover—and if red be sown, to make that thrive astonishingly. Its effects on the two cuts I tried it on, seem very durable. One was used in the hill with corn, mingled with the earth, about a hoe full to the hill, chopped in, and the corn planted in the mixture. It trebled the product in corn, and the wheat which was ventured to be sown, from the fine crop of corn, showed double as rank, just as the marl was spread partially, by ploughing in and harrowing. The

clover was equally uneven. Where the marl reached, it grew knee high, and was deep colored; elsewhere ankle high, and being of pale color, though both was equally plastered in the spring. Where I spread broad-cast at the rate of 100 bushels to the acre, the crops of corn, wheat, and clover have attracted observation by all travellers. I have taken a crop of one kind or other from it every year; the second growth of clover seeming to keep up the fertility, and rather to increase it, I think. Certainly the crop of clover was better this year than when cut before. The piece marled in the hill has never been aided by manure; has been cropped in the same way, and that is much improved. I cut a good crop of clover from it this year, and observed the same rank spots where the marl reached, as at first. While my mulberry orchard is growing, these two years to come, if I live, I shall, now that my heavy clearing is over, enter into marling with some spirit. I am encouraged to do this, not only by my own experience, but that of many others. Mr. William Jessee, and others in Middlesex, and Mr. William Wickham and Mr. James T. Sullon in Hanover; besides many acquaintances in King William and around me. My neighbor, Mr. John H. Bernard, Francis W. Taliaferro, and Henry Tayloe have all demonstrated the great value of marl, both shell and blue, upon their estates.

Your valuable work on calcareons manures, and the Register, have given a happy impulse to this essential means of improvement. The community is having its eyes opened to the fact, that permanent improvement of land is impossible without the use of marl or lime, to fix the putrescent matter in the soil, and give activity to its capacity for generating the proper salts and other ingredients on which vegetation feeds. May the good work increase and prosper! It may be truly said, that every man who marls an acre of land, is a benefactor to his country, and deserves the thanks of the community.

In conclusion, I will give you another statement of a trial which I have made, which cost little, and has satisfied curiosity.

About this time last fall, in hunting by the side of my spring branch, below the great fall of it over a blue marl bank, I came across a large bunch of gama grass, with fifteen or twenty seed stems seven feet high. Last spring I took up the bunch (about ten inches diameter,) and separated the plants by the roots, and transplanted a row on the side of my garden paling, and about as many more, (say fifty,) in lively land near where I found the bunch, and worked both once to keep them clear of weeds. Those in my garden are rankest of course, but grew so slow and puny, although in rich soil, that I am satisfied our climate will not permit it to be of much account—at least, not worth the attempt to raise a lot for summer soiling, as I had hoped. I shall have a fairer experiment in the next year's growth, as the roots get better footing and more vigorous. I find the seed ripen by degrees, and drop as quick as ripe, so that it is hard to save the seed of it, and I fear the early frost has injured most of them, though the blades are untouched.

JOHN DICKINSON.

STATEMENT OF TILLAGE AND PRODUCT OF CORN, ON STAUNTON BOTTOM LAND.

To the Editor of the Farmers' Register.

I have been requested by two or three of my friends, who saw a small field of corn growing the present year on my premises, to give an account of its produce, to the public, through the columns of the Farmers' Register. I have measured and penned the corn that grew on three acres of the above mentioned field, and will confine my remarks to the three acres, which were the best in the field. I do not recollect the precise time when this corn was planted. I commenced planting about the time my neighbors did, and the field was planted several days later than my first planting; so that I conclude it was neither late nor early planting. The ground it grew on was the best Staunton river bottom, which had been cleared upwards of a century. In the year 1833 it was not cultivated, and produced a fine coat of vegetable litter which was suffered to rot (ungrazed) on the land. The succeeding year, 1834, it was cultivated in tobacco, and in 1835 planted in corn. The spring ploughing was a bed upon two shovel-plough furrows for half of the three acres, and the other half was bedded on two coulter furrows. The bedding was done by two-horse dagon ploughs, as deep as practicable. I generally prepare my flat land with three-horse ploughs, but this field had been well broken, under the previous tobacco crop, and the two-horse ploughs effected as deep ploughing as a three-horse plough would, on a naked fallow. The beds were about four feet apart—rather under that distance. The corn was planted eighteen inches apart in the bed, (in the step, as it is usually termed,) and two stalks were left in a place after weeding. At weeding, the beds were thrown down by a dagon plough, and a deep coulter furrow run on either side of the young corn—as near to it as practicable. The second and last working was done by a single-horse dagon plough, the rows being too near to admit two horses abreast. The produce of the three acres was fifty-five barrels of sound corn and several barrels of rotten, that were not measured—making upwards of eighteen barrels of sound corn to the acre.

My principal object in making the above communication is, to direct the attention of corn planters to the subject of thick planting on rich, moist land. There is much land in this vicinity as fertile as the land above mentioned, and yet, the product to the acre seldom exceeds nine or ten barrels.

The three acres were accurately measured, and, to prevent misapprehension, it may be proper to add, that ten bushels of corn in the ear were allowed to the barrel. Two rows were permitted to stand with only one stalk in the hill: these were gathered and measured with two adjoining rows with two stalks in the hill; the latter measured between a fourth and a fifth more than the former, thus conclusively determining the advantage of thick planting. The two rows with only one stalk in the hill were thinned at weeding time.

The little experience I have in farming and planting, has convinced me of the great importance of making the land we cultivate rich—"cultivate less land, and make it rich" should be the motto

of every planter, without an exception, of my acquaintance.

The corn that grew on the three acres was made at a fourth (at least,) of the expense of any equal quantity of the balance of my crop—the corn in the same field with the three acres excepted. In the first place, when a small crop is cultivated, so much time may be devoted to the first preparation of the field, that but two workings are necessary. Less land and less labor is required to produce the same result. I observed in getting up the corn, (it was hauled on the stalks to the farm-pen,) that the carts were filled more rapidly than they were in the poorer fields, owing to the fact of the thick corn being more concentrated. The cutter would generally at one stroke take down two stalks; the laborers that picked up the stalks have less walking to do; the fodder and tops are also gathered with less expense.

The ratio of increase of the number of ears, as the distance between the corn stalks is diminished, is greater than one would, at first thought, suppose. For instance, if one plants his corn three feet apart every way, he has 4840 corn hills in the acre; if he just doubles the distance and plants six feet apart, he has only 1210 corn hills in the acre: increasing the distance by the multiplier two, diminishes the number of hills by the divisor four. So that, if the ears of corn were as large, and the same number of stalks in the hill, an acre of land that would produce five barrels when the hills were six feet apart, would produce twenty barrels when the hills were three feet apart. This fact at once shows the great loss from not planting corn as thick as the land can bear it. The advocate for thin planting would say, that "what is gained in number by thick planting, is lost in the size of the ear:" but in the two cases put above, the ear must be four times as small in the thick acre in order to reduce the quantity to an equality with the product of the thinly planted acre. Nothing is more common (when instituting a comparison between two fields of corn) than the remark, "that one field is better than the other *because* the ears of corn are larger," and, "that the corn in the small eared field was planted too thick, *because*, the ears might be larger by thin re-planting;" whereas, in nine cases out of ten, if the corn in the two fields was brought to the measuring tub, the thickly set field would be found to yield the most corn.

The size of the ears that grew on the three acres above mentioned, was so large, that I am convinced the corn was not thick enough, and have in mind to try still thicker planting next spring. The experiment will of course be confined to low moist land: as the want of moisture would as effectually check the growth of extraordinary thick corn, as the want of fertility.

I will add, in conclusion, that a good cart load of pumpkins grew on the three acres, and that Mr. John R. Elam witnessed the corn accurately measured.

G. W. READ.

Charlotte County, Nov. 5, 1835.

From the Romney Intelligencer.

MAMMOTH APPLE TREE.

We are indebted to a highly respectable gentleman of Hardy county, [Va.] for the following facts relative to a mammoth apple tree, on the farm of Capt. Daniel McNeil, of that county. Our informant says he took the dimensions of this mammoth apple tree carefully and accurately, and found it to be 45 feet in height and 55 in breadth; circumference of the trunk 9 feet 4 inches. About seven feet from the root there are eleven branches, the average size of which are 3 feet 10 inches in circumference. But the most remarkable fact about it is, the quantity of fruit it bore the present year—one hundred and eighty bushels of apples were taken from it this fall. Four or five bushels, of such as were bruised and partially and entirely rotten, were left under the tree: and a good deal of its fruit must have been taken away by different persons through the summer and fall; so that the real quantity it bore must have been very near, if not quite two hundred bushels. The apples are very large. It stands near the South Branch, on very rich soil. I have been informed that it did not bear any fruit until after it was twenty years old. It grew spontaneously where it now stands, and, although forty years old, continues to grow.

From the Farmer and Gardener.

RIBBON GRASS.

Plainfield, Windham Co., Ct.

DEAR SIR—I received a letter from you, a short time ago, requesting information concerning the ribbon grass [*Phalaris Americana.*] The grass you saw at Plainfield, on Mr. Woodward's farm, two years since, I was informed originated from the ribbon grass. It was originally cultivated in the garden for ornament, where it spread, to the great annoyance of the vegetables. Mr. W. became dissatisfied with it, dug it up, and threw it over the wall into the mowing lot, where it continued to grow luxuriantly. Being determined to get rid of it, he again took it up and threw it into the brook. It was so tenacious of life, that it seized upon the watery element and spread rapidly down the brook, so that in a few years it extended down the brook more than a mile; its progress towards dry land was more slow, but has eventually spread over a number of acres, converting a bog meadow into the best of mowing. Mr. Bowen, who lived on the farm, informed me that he mowed it twice in the season, and that it produced about three tons to the acre, annually, of excellent hay, which the cattle consumed with as much avidity as any that was cut on the farm.

The meadow was so miry in many places, that cattle could not pass, but the grass roots formed such an impenetrable surface, that they could cart over it, in getting hay without difficulty; and, in some places, they entirely united across the brook, forming a natural bridge that a person might pass over. The brook is sufficiently large to operate a cotton factory which has been erected about a mile below.

I have taken considerable pains to ascertain the history, character and importance of the ribbon grass, and come to the conclusion, that it was originally an aquatic grass, and that the striped color was produced by being transplanted into a dry, gravelly soil. I have seen it in a number of places where it had been cultivated for ornament, spreading beyond its boundary and outrooting

other grass: in these instances, if in the shade or on moist ground, it loses its striped color. In one instance, the roots passed under the garden wall into the back yard, and entirely eradicated the other grass, and occupied a number of rods of ground, when it grew rank and lost its striped color. I have not been able to ascertain the best mode of propagation; it produces little if any seed that will vegetate. The striped grass of the garden, I am confident, does not produce any; for we have cultivated it for near twenty years, and have never known a single spear that was produced from seed. The Phalaris that grows in wet land, blossoms abundantly, but produces very little seed, and that is liable to become fungus, resembling the spurred rye. The propagation by transplanting the roots into wet land among the bogs, although attended with but little labor, must take considerable time to entirely eradicate the bog grass, as I have proved by experiment. I transplanted, a number of years since, into a bog meadow, some of the grass, and although it took root and grew rapidly, spreading among the other grass, and even sending up shoots in the centre of bogs, still the bog grass remains. I planted, as an experiment, about one-half of an acre bog meadow with the Phalaris a year last spring, it having been previously ploughed for two or three years; it was planted four feet apart each way; it all lived, and is spreading well, and probably in a few years will occupy the whole ground. I have ploughed up one acre more, and intend to plant it in the same way. I also sowed some of the seed last spring, procured from grass that grew on wet land, but am not certain that any of it has come up. Shall sow more next spring, and hope in a few years to be able to ascertain its importance, and the best mode of cultivation.

Yours, with respect,

ANDREW HARRIS.

Hon. Elizur Goodrich, Jr.

From Kenrick's New American Orchardist, (2nd edit. 1835.)

CLIMATE.

The climate of the Atlantic States has been generally characterized as variable and inconstant. These sudden changes are caused in a great measure by the conflicting winds, which blow alternately from the opposite points—the sources of extreme heat and of excessive cold. Those especially from the southeast, and south, bring alternately, clouds charged with sultry vapors, or storms of rain, or the fiery particles and intense heat which they have inhaled in the equinoctial regions. While the winds from the northwest are not only dry, but coming over the enormous mountains, covered with ice and snow, and from the immense frozen territories which stretch towards the Arctic regions, and thence westward, and from the great icy ocean towards the pole, they imbibe at certain seasons, a degree of cold the most piercing and intense. These adverse winds bring by turns, and often by sudden changes, the heat of the tropical, or the extreme cold atmosphere of the polar regions.

The disastrous effects of these sudden changes from heat to cold during the spring, appear to be much more sensibly experienced in the states of the south, than in those of the north. For in the latter states, the frozen earth at its surface, is for the most part protected during winter, at the freezing point, by the usual covering of snow. Vegetation slumbers profoundly secure, immured in our winters so intensely cold, and so fortunately prolonged—nor awakes till the danger is past.

The climate of our country, in regard to its capacity and vegetable productions, is not to be estimated by the measure of its distance from the equator, nor by the average temperature of the *winter*, or even that of the *year*—but rather by the *mean heat of summer, and its duration*. For while the average temperature, or *heat of the year*, is greater at Rome, aud at Marseilles, than at Cambridge, Mass. the *average heat of the summer months may be nearly equal*, since the *mean of the greatest heat* at Cambridge, exceeds that of Rome by 11°—and that of Marseilles by 8°—the mean of our greatest summer heat being 97°; though 100° and over, in some summers, is not with us uncommon.

From the average of the observations which have been made in 20 cities on the continent of Europe, the climate of America has been compared. And the proportion of rain which annually falls is two-fifths *greater* with us than with them, or as 50 inches to 30. Yet our rainy days are annually, from a fourth to a third *less* in number, than with them, or as 85 or 90 days of rain with us, to 122 days with them. The rain with us descending in profuse showers, and often in torrents, with tremendous lightning and thunder. While on the other hand, the number of our fair days, or days of sunshine, in the year, is double that of the 20 cities of Europe, or as 130 bright days with us, to 64 with them. In this respect our climate is doubly blessed, in our serene skies, and our more perpetual and brilliant sunshine.

The climate of a country is variously modified by its situation in regard to mountains and to the ocean. The temperature of the climate on our extensive Atlantic coast, differs considerably from those parts of Europe and of Africa, which lie in corresponding latitudes. In like manner, the climate of our country will be found continually varying, as we advance longitudinally, from its eastern to its western shores.

It has also been observed, that within the temperate zones, the *western coasts* of continents, and large islands, are found to possess a higher mean temperature than the *eastern coasts*. Our climate, on the shores of the Atlantic, must, therefore, correspond nearly with that of the eastern coasts of China, Japan, and Chinese Tartary, and the islands on its coast. And the climate of our country which bounds on the Pacific, may correspond nearly with that of Europe on the coasts of the Atlantic, in the corresponding latitudes.

Elevation above the level of the ocean, has the same effect in lowering the mean temperature, as an increase of latitude. Mons. de Candolle has ascertained, by experiments on some mountains in France, that the elevation of 180 or 200 yards, affects the mean temperature, in the same proportion as a degree of latitude to the north, on that same meridian; and in a similar proportion for any increase of height.

The growth of trees and plants, in rich moist

soils, and in warm and protected situations, is not only unusually rapid, but is also prolonged to a very late period in autumn, or until suddenly arrested by frost; and the immature wood of a forced growth being tender, is the more liable to be killed by early frosts and by winter.

On the other hand, those trees and plants which grow on dry and stony or sandy soils, and on the open plains, and on the hills which are most of all exposed to cold winds, the wood completely matures in due season; and such trees are found to suffer least of all from early and destructive frosts, and from winter.

Delicate trees and plants, the natives of southern climes, become more hardy, and more capable of supporting the northern winters, by being planted on the north sides of buildings and in their shade. Their growth being thus modified, the exposure to the most intense degree of cold, in such situations, is more than compensated by the protection which is thus afforded to the plants during winter, from the pernicious, and far more destructive rays of the sun.

More delicate shrubs or plants, may be protected by being surrounded by a thin covering of straw. They may also be protected by a few inches of litter placed around their trunks, and over their roots. Moss from the meadows, or evergreen boughs, being more incorruptible, are to be preferred for delicate plants. For it has been lately announced, as an important fact, that the destruction of delicate plants which is sometimes occasioned by winter, is caused by the alternate freezing and thawing of the earth at its surface—that death commences at the surface, which this protection will prevent.

The finest fruits of the tropics, when cultivated in countries remote from the equator, lose their good quality and sweetness. In the climate of England, we are assured from undisputed testimony, that the finest peaches of America prove "*worthless.*" Even those which, confessedly, travellers with us, so much admire, with but two exceptions, prove good for nothing in their hostile climate, not coming to their full maturity and excellence, even on the walls to which their cultivation is confined. Fifty American kinds were contained in their garden, at Chiswick, at the time their account was written. [See Pom. Mag. No. 54. Also, Cat. Lon. Hor. Soc. for 1826.]

The *pavies* [cling-stone peaches] particularly, are there denounced, generally; while in warm countries they are preferred to all others.

Some of the finest apples of America, and of Italy, seem also in that country to have shared a like disastrous fate—and the *Pomone Finale*, or *Mela Carla*, which in the climate of Italy, is reputed to be the finest apple in the world, proves in open culture, in England, but an ordinary fruit, as their writers assure us.

The reverse of this is also true, and many fruits of the north will be found to depreciate, when cultivated in a warmer latitude. And the *White Moscow* or *Astracan*, which by the celebrated M. Christ, is described as a fruit so very extraordinary "*in a suitable situation and climate, which is not under* 49° *of polar elevation.*" This fruit is pronounced but at mediocrity at Paris, and with us proves an indifferent fruit. And many of the fruits, the natives of England, and of other northern countries, and of high reputation there, have proved but ordinary when brought down to our own latitudes, and compared with our own fruits, and those of climates equally favored with us.

The cherry tree, the pear, the apple, and many other kinds, when carried within the tropics, become unproductive or barren, or the fruit worthless.

The olive and the vine may indeed grow within the tropics; but we are assured they produce little or no fruit, except in the mountainous elevations.

The cereal varieties of grain, the annual plants and productions, those most necessary to the subsistence of man, have by him been acclimated from the borders in the tropics, to very high northern latitudes.

Man himself has become habituated to all climates. The horse, the most noble of animals, and the ox, the most useful, seem, under the guardianship of man, in some measure, alike constituted. The horse and his rider traverse the earth, from the burning deserts of Sahara, to the frozen regions of Siberia, and the boundaries of the Arctic circle.

Extracted from Kenrick's New American Orchardist, (2d edit. 1835.)

ACCOUNT OF THE CHINESE MULBERRY TREE (*Morus Multicaulis.*)

[We have at various times laid before our readers detached notices, of the properties and value of the Chinese mulberry, the culture of which, in connexion with raising silkworms, we are persuaded will hereafter be very important to a large portion of Virginia, and other southern states. Some of the most recent European discoveries we have been enabled first to offer (though translations) to the American public—and one of these new facts, (which is referred to in the following extract,) is all important to those who design to raise the new mulberry, viz. that this kind cannot be propagated by seeds, so as to preserve its peculiar character and value. The following extract from the recently published second edition of Mr. Kenrick's Orchardist, brings together much of what is known on this interesting subject.]

Of all the varieties of mulberries for silk, the Chinese mulberry or *Morus Multicaulis*, appears that which is most eminently entitled to preference. It originated in the elevated regions of China, a country famous from antiquity for its silk, and renowned for its industry; a parallel to our own in its climates and divers latitudes. It is to this tree, that the disciples of Confucius, acknowledge their indebtedness for the prosperity and solidity of their empire.

The *Morus Multicaulis*, or *Chinese mulberry*, since its introduction to France, seems destined to replace, every where, the common white mulberry, for the nourishment of silkworms, such is its decided superiority over all others. The tree is beautiful, and of a rapid growth. The leaves in a dry and arid soil are of less size, and elliptical, their breadth being six inches and their length eight; but in a light, friable, rich, and humid soil, they are large and cordate; extraordinary speci-

mens having sometimes measured more than a foot in breadth, and fifteen inches in length; their upper surfaces are convex or curled, and of a deep and beautiful shining green. The fruit which was unknown even in France till 1830, is long, black, and of appearance sufficiently beautiful, its flavor good, being intermediate between that of the red, and that of the black mulberry; its produce is abundant.

This mulberry differs from all others in the property which the roots possess of throwing up numerous flexible stalks; the great length which these stalks acquire in a short space of time; and the facility with which it is propagated from layers, or even from cuttings; also from the remarkable size which the thin, soft, and tender leaves, speedily acquire, and the promptitude with which they are renewed.

The silk which the worms form, from the food afforded by this plant, is not only of superior quality, as has been abundantly proved in France, but the cocoons are of unusual size. The leaves from their extraordinary dimensions, being gathered with important economy of labor, and of time; and from their superior nutritious qualities, they are preferred by the insects to all others.

This mulberry should be cultivated in hedge rows, and never suffered to rise higher than seven or eight feet. But a few years are sufficient to raise considerable fields of them in full vigor, sufficient to support an immense number of silkworms; and regular plantations can be speedily formed, by planting the shrubs at the distance of from six to eight feet asunder; a space sufficient for the extension of the branches—sufficient also for cultivation, and for the greater convenience of gathering the leaves. So greatly is this last operation facilitated, by the flexibility of the stalks, and the very superior size of the leaf, that as we are assured by M. Perrottet, a child is sufficient for gathering the food for a large establishment of silkworms.

The introduction of this plant from Asia is due to M. Perrottet, Agricultural Botanist, and traveller of the Marine and Colonies of France. It was brought by him to France in 1821, in that vast collection, and variety of productions, which he had, during thirty-four months, procured in the seas of Asia, or gathered on the coast, or in the lands of Guiana.

From Manilla, the capitol of the Phillippine Islands, whither it had been brought by the Chinese as a tree of ornament, as well as of eminent usefulness, it was introduced by M. Perrottet into the Isle Bourbon, and from thence into Cayenne and France. At a later period it was sent from Cayenne to Martinique, and from France to Gaudaloupe; also to Senegal; the numerous plants which are already disseminated in the divers climates of Africa, of America and Europe, have all been produced by the two individual plants which were brought by M. Perrottet from Manilla. At first, its cultivation in France was confined almost exclusively to the royal gardens, that its trial and dissemination might be thus rendered the more effectual throughout every department of the country. The Morus Multicaulis, according to M. Perrottet, will be readily acclimated, inasmuch as it originated in a country analogous to that of France; it appeared neither to suffer from the excessive cold of the northern, or the intense heat of the intertropical regions, as the plants in the government gardens of Cayenne, had acquired during eight months a truly remarkable developement, being clothed at that time with leaves of extraordinary size; those also, which were cultivated in Senegal, although planted in an arid soil, and situated beneath a scorching sky, exhibited an appearance sufficiently satisfactory; yet in all respects, they had acquired less developement than those which were planted in the humid climate of Guiana.

M. Poiteau, in the Annales d'Horticulture, has stated down to 1830, "that by the information which we receive from all quarters, this mulberry is destined to replace the common white mulberry, every where, for nourishing silkworms." "This mulberry has not suffered in the least, from the rigors of the last severe winter."

At New York, on Long Island, this mulberry had endured unprotected the rigors of seven winters, and the very extraordinary winter of 1831-2 which destroyed so many trees hitherto deemed hardy, even to the root. Yet in our climate,* there are many kinds of trees which require protection during the first winter, though they may never need it afterwards. Such are the young seedling plants of but a single summer's growth, of the *cherry, plum, pear, the quince and white mulberry.* All which require to be taken up in autumn, and laid slanting in earth, their bodies being in part protected by soil. For all these species are liable to be killed occasionally to the root by the first winter, or to be utterly destroyed by being thrown out by frost; yet in the second winter it is far otherwise; their roots becoming strong, and firmly established, the well ripened wood of the second year, and the wood of two years' growth, becomes indestructible by any but extraordinary winters. The same precautionary measures should in northern climates, be taken with the young plants of this mulberry so valuable—the layers of but a single summer's growth, which are separated in autumn.

The vegetation of the Morus Multicaulis, particularly in a rich and humid soil and protected situation, is extremely rapid and luxuriant, and prolonged to a late period in autumn, or till the tender and yet vegetating tips of the twigs are checked by frost. These extreme ends will generally be lost, as they always are of the *common white mulberry*, when young.

Jonathan H. Cobb, Esq. of Dedham, author of the excellent "Manual on silk," has tried them for several years, and in a letter dated 1834, he confirms the latter remark, and adds "but that we shall be able to rear it here, is decided beyond a question." Mr. Joseph Breck a distinguished botanist of Lancaster, from very critical observation of 100 trees which were set out on the place of S. V. S. Wilder, Esq. in Bolton, late in the spring of 1833, in a cold, springy soil, and northern exposition—seems persuaded from an experience of one winter, 1833-4, and from careful observation, that they may be even hardier than the common white mulberry, as they appeared to suffer less than some hundreds of the latter of three or four years' growth which stood beside them. Of any extraordinary results from a win-

* New England.—Ed.

ter so unparalleled and unheard of as this last has been, throughout the country, time will soon decide; and how this mulberry and all other productions have fared from north to south. This mulberry braves the most rigorous winters of France, even to the extreme north as far as Havre. Of this important fact, we have been assured from the first rate sources; from MM. Perrottet, Bodin, Poiteau, also from M. Eyries of Havre, who has there cultivated them from their first introduction to that country.

The prediction of the late Dr. Pascalis in 1830 that, "*after the discovery of this plant, a doubt no longer exists, that two crops of silk may be produced in a single season;*" this prediction has since been accomplished—its truth fulfilled by experiment. The soil and cultivation—the habitations for the successive generations of insects being yet the same, all thus converted to *double* use—and the production of a *double* harvest—it will be obvious, that the actual profit thus augmented, must be manifold.

It appears from the deliberations of the French Royal Society of Horticulture, (as noted in the Farmers' Register) that the Chinese mulberry or Morus Multicaulis is not a distinct species, and that as a new and invaluable variety, it can only be preserved by multiplying it from grafts, layers, and cuttings; and that by these means exclusively, have the Chinese cultivators reared the tree from time immemorial. Seeds sown near Venice, have, it is stated, produced varieties, but none like the true Morus Multicaulis. I have myself examined about forty trees, raised in 1834 from seed sent from China, but they appeared to differ from the true kind. Their leaves were indeed handsome, but I saw none with the curled or convex leaf.

From Kenrick's New American Orchardist, (2nd edit. 1835.)

NUMEROUS SUCCESSIVE CROPS OF COCOONS.

From the present encouraging appearances, we are induced to believe, that instead of one single and solitary crop of silk in a year, we may yet be enabled, in our climate, and with our prolonged summers, to raise not merely two crops of silk a year, with a void interval of time between them, but numerous crops of different ages at the same time and in rapid succession for a season. With the complete establishment of such a system, a new era with us will commence. There are mulberries which will renew their foliage suddenly, and for numerous successive times in a season. Where a regular succession of crops can thus be obtained, with a diminished proportion of labor, of land, of cultivation, of habitations and of furniture, for the successive generations of insects, how greatly augmented must be the profit.

Some, I am aware, might object, on the supposition that the plan has been before tried an hundred times in Italy, in France, and other countries. Not a doubt exists but it has been tried. But we have no evidence whatever that in a suitable climate, it has ever been tried fairly and aright, and failed. It seems important, that in this case, only the eggs of the former year should be used, as these by age, are found to hatch more promptly and simultaneously, and all these may be saved from the cocoons of the first crop produced, which would prevent the possibility of a degeneracy. These are to be preserved dry at a suitable temperature, and to be transferred to an ice house if necessary, till the season they are wanted. Dr. Millington, however, is persuaded that it might be advantageous to have different races of different ages.

In Tuscany, so fine is their climate, that two crops of silk are annually produced. The same has been effected by Mrs. Parmentier at Brooklyn, on Long Island. The first crop being fed from the leaves of the *Morus Multicaulis*, *Morus alba*, and other mulberries promiscuously, were of different colors, some white, and some of an orange color. But a second crop of worms from the same cocoons, being fed exclusively on the leaves of the *Morus Multicaulis*, finished their labors in the short space of twenty-six days from the commencement, which was about the 30th of July. This last circumstance might be, in part, owing to the warmth of the season. The cocoons thus produced were not only of larger size than those of the first crop, but what is still more important, they were beautiful and shining, and of the *whiteness of snow*.

At the Fair of the American Institute of New York in 1833, cocoons were produced of two successive crops of silk. The first crop were hatched 11th of May. The second crop the 8th of July, and a third crop might have been produced. All being fed on the *Morus Multicaulis*, they were of a snowy whiteness. In the same year Mr. E. Stanley of Ogden, N. Y., produced two successive crops, the second were hatched by accident, and the cocoons were fine. In Brattleborough, Vt. in the same year two successive crops were produced from the common white mulberry. And in 1834, as Dr. Holmes has recorded, *two crops* of cocoons, both of them large and perfect, were produced in Winthrop, Maine. See his account in the *Maine Farmer*, vol. iii. Feb. 20, 1835, published at Winthrop.

In all these cases, the second crop of silkworms was produced from the eggs from the cocoons of the first crop.

Dr. Millington however, states that this practice is wrong. In his valuable communication in the American Farmer for January, 1829, he has stated that the eggs of the same year hatch but partially, or do not hatch so regular as those of the former year. He notes the date and the day the eggs are produced, on the papers on which they are deposited; and those eggs of a similar age are brought forward to hatch at the same time, and then they usually are all ready to spin together. These are carefully rolled up and preserved in dry boxes, and kept in a dry cool cellar, and in June or July of the following year, and when the heat of the climate or season requires it, they are transferred to a dry ice house.

Among the great advantages of having silkworms of different ages in the same apartment, Dr. Millington states, "that the same room and shelves will hold abundantly more worms at the same time, without being crowded; and a room and shelves which will but barely accommodate 100,000 full grown worms, will better accommodate 250,000 consisting of four or five different ages, provided each age or parcel are about equal in number, and are hatched at about seven or eight days apart. Another advantage is, the same number of hands, with the same quantity of

labor, will make more silk and do it with less trouble and perplexity, than when the whole crop of worms are of the same age and all spin at the same time. When silkworms are young, they are extremely small, and require but little room, little food, and little attention. All the food they consume, up to the time they are sixteen days old, would not make more than one meal for them when full grown; consequently when the whole crop of worms are of the same age, there is at first but little to do; but for a few of the last days they will eat voraciously, and must all be removed and cleaned frequently, and all set to spinning at the same time. So much to do at the same time creates a hurry and perplexity which must eventuate in a loss for want of time to do all that is required. * * * When the worms are of different ages, the labor required is more equalized. A part of them will constantly be of the age to require considerable attention. But this parcel will be so small, that the hands will have spare time to attend to the younger parcels. I have certain shelves allotted to each parcel during a certain age; and *other shelves exclusively for them to spin on.* I begin with the fresh hatched worms, placed on the shelves allotted to worms of that age. After their first moulting I pass them to the shelf allotted to the next age, and again supply the first shelf with fresh hatched worms. In this manner I continue, through the whole season, to bring young worms on the first shelves, and pass them on until they reach the spinning shelves, from which the cocoons are removed, to make room for the next succeeding parcel."

"Last year I had silkworms constantly in feeding from the 20th of April until after the 20th of October."

We are assured on first rate authority, on that of Gideon B. Smith, Esq. of Baltimore, that Dr. Millington is an eminently practical, scientific agriculturist, and has made silk one of the principal objects of his attention during several years. Mr. Smith from his own experience, "bears testimony to all Dr. Millington's remarks. And considers his as the very best article which had yet appeared." This was in January, 1829. Dr. Millington resides at St. Charles, in Missouri, about latitude 38°.

I am perfectly aware, that the excellent Dr. Pascalis, at the time he published his work on silk at New York in 1829, endeavored to explode the idea of attempting to raise numerous crops, or even two successive crops of silk in a season. He states some plausible reasons for his objections, particularly the record of the failure of an attempt near Lyons about 1820—and also the failure of the attempts at the Isle of Bourbon, situated beneath a fiery sun, and within the burning zone. In the next year and in No. 2 of his valuable work, "The Silk Culturist" for January, 1830, Dr. Pascalis has recorded the successful introduction of the silk culture to the *north of France*, a thing which had been deemed at least, equally as problematical thirty years before. Also that Dr. Deslongchamps had even succeeded in raising a second crop of cocoons from the eggs of the first. Dr. Deslongchamps was one of a society of *savans* at Paris who had performed many experiments to prove that this branch of industry can be successfully carried on through all the northern departments of France. He also had ascertained by experiments at Paris, that the cocoons which were produced by silkworms fed exclusively on the *Morus Multicaulis*, were even rather heavier than other cocoons. The more complete and effectual conversion of Dr. Pascalis to the system, does not appear so fully until afterwards, when speaking of the *Morus Multicaulis* which he had received from France, he says, "after the discovery of this plant, a doubt no longer exists, that two crops of silk may be produced in a single season."

THE SUPERIOR ADVANTAGES IN WARM REGIONS TO BE DERIVED FROM FLOODING LANDS, BY DIVERTING THE WATERS OF RIVERS.

Translated for the Farmers' Register, fom the *Annales de l'Agriculture Francaise.*

[The following is part of a much longer article, on the great superiority possessed by the cultivators of southern regions, over the northern, in deriving benefit from irrigation. We have here only given the general statements and reasoning of the author, (M. Gasparin,) which seem undeniable, and which will serve the purpose of attracting attention to this subject, which is no less novel than important in the hilly region of the middle and southern states. We are the more willing thus to limit the space here given to this subject, because so many of our pages have recently been occupied by more practical details of irrigation, and more particular and accurate estimates of the cost and profits, in moist and northern countries. Whatever advantages are derived from this practice in the latter, are certainly very far less than are to be obtained in warm and dry countries. Upper Italy, one of the most productive parts of the globe, owes its superior agriculture entirely to irrigation—and even in Spain, one of the worst cultivated countries in Europe, this practice is pursued to great advantage, though almost no other improved or scientific practice is any where there, in use.

The flooding spoken of by the French author, is very different from the more perfect British methods of irrigation, described in our two last Nos. Instead of distributing, very equally, and using up a small supply of water, and saturating the soil with it, the general plan here spoken of, is to divert the courses of large streams, and at proper times to pass a flood of water rapidly over the neighboring sloping grounds, so as to imitate the natural process and effects of a very heavy rain, of short continuance. The artificial works for this purpose, on any one point of a river, would necessarily be on a large and expensive scale, and would require the concurrence of many proprietors, and even of legal permission and aid: but the operation is comparatively very simple, and would serve to benefit the farms of many different persons, and perhaps form many miles in extent, at a small cost for each.]

The great question regarding machinery is not completely settled by my former work; doubtless the application of mechanical means has exalted our species; the developement of this powerful principle tends to dissipate those dangerous col-

lections which industry has brought together in our large cities; it will confine hands in the country. But machinery itself is going to take possession of the fields; the steam-plough will soon open the furrows of England; the human intellect will borrow more and more from nature her powerful co-operation; the inheritors of labor will respond in the fields to this same cry of fright that the work-shop utters, at the view of this unexpected disturbance, of these new means, which are coming every where to take the place of muscular strength; at first they will not understand, they will receive only with fear, the noble gift of intellect. Let us seek to prepare and to make comprehensible this great and salutary crisis; let us prevent, by an exposition of facts, and an explanation of their consequences, the shameful leagues of slavery and barbarism; let us smooth the way for the conquests of science; let us establish the true principles of independence based on the ennobling of humanity; and may the echo of our fields return only a cry of liberty.

But whatever may be the power of these machines; whatever may be the force which they conceal in their burning centres; with whatever unexpected effects they may strike our attention, they will not be able to surprise *us* who have long possessed and enjoyed the effects of an engine, simple, but greater, more prodigious than all that the force of steam united to the most powerful levers could ever produce; which rolls fertility and abundance into our plains; which, at once, increases ten-fold the value of our soil, and lavishes upon us riches without labor. It is the *inclined plane.*

What people better prepared for the prodigies of industry than the people of Vaucluse, who borrow from the Durance, from the Sorgues, and all their tributaries, so much wealth and repose. In vain might you demand from manufacture its most ingenious processes, and apply them to the cultivation of your fields; would you ever make any thing to equal our magnificent meadows? They are as a constant precept, a living lesson that it is not by his sweat, but by simple and rational combinations, that man establishes his empire. This admirable and simple machine, the effects of which we are about to describe, of which we invoke the influence, does not require, for its action, extended space or wealth. Small with the small, great with the great, it adapts itself to all, in every proportion: with its simple or powerful apparatus, it follows the levels traced out for it by intelligence.

It is on this magnificent amphitheatre which is displayed from the summits of Ventoux to the shores of the Rhone; in this country which possesses, on a limited space, from the alpine pasturages at a thousand fathoms above the sea to the lands which sink almost to its level; it is on this varied soil that, without passing beyond the mountains, we may study the instructions of Italy.

In traversing the department of Vaucluse, one is struck with two very distinct kinds of agricultural success: the first which is united to what I shall call the turbulent and bustling civilization of the north, with its energy, its tools, its labors, which swallow up every instant, overturns, breaks up, undermines the earth: the other, the noble inheritance of antiquity, which reposes upon the herbage, invokes the aid of the streams, directs them tranquilly over the soil, and awaits their immense results. It is this which we are now about to speak of, because it accords with our principles, because it is the civilization of happiness. It respects leisure; and a simple, but heroic means, it comes here to supplant those complicated arrangements which exhaust the human race.

At Orange, the fiftieth part of the territory is subjected to irrigation, and however small this extent may be, it becomes sufficiently important to form a striking feature of our agriculture. Meadows as beautiful as those of the Milanese, are mowed three or four times a year—and rent for 850 francs the *hectare;* about a third of this sum goes for the expense of cultivation. Such a product represents from thrice to ten times the revenue of soils identically similar under the ordinary culture; and when we reflect that such an advantage is obtained almost without labor, we should confess the superiority of this kind of cultivation.

At Avignons this trait of our southern agriculture is displayed on a greater scale. A canal from the Durance, the waters of the Sorgues, and the daily employment of these means, have extended irrigation over a greater circle. The water here also triples the value of the excellent lands which surround the city.

At Vaison, at Malaucene, irrigation raises the value of soils, naturally inferior, to 12 and 14,000 francs the hectare.

At Cavaillon, where such various productions are drawn from the soil; where the melon and the artichoke are cultivated on a grand scale; where corn, under irrigation, braves the greatest droughts, the water of the Durance has in certain places increased the value of the land ten-fold. Uncultivated tracts which were scarcely worth 500 francs the *hectare* are now worth 5000.

At Sorgues, a barren heath, which distressed the eyes of the traveller, irrigated by these same waters, has been centupled in price: smiling fields worthy of Lombardy have replaced the desert.

It is under feeble means, nevertheless, that these riches of the soil are developed; it is almost only at Cavaillon on the immediate borders of the Durance that they have acquired a remarkable developement: every where else they are trials, they are as an example bequeathed to our posterity, to show them what they can, and ought to do; they are traditions of antiquity, a recollection of Italy: they are some scattered shreds which defend themselves from the encroachments of the plough. Here, recourse is had to the waters of a fountain—there, they borrow from a torrent, which the heat of summer soon dries up. At two spots, feeble brooks confined by dams, form useful reservoirs, which constitute the prosperity of two villages.

At Caromb, and at the Tour d'Aigues, the hand of intelligent man has given a great example; it is a seed which will produce its fruits when the direction of agriculture shall cease to be confided to the isolated efforts of our husbandmen; when government shall comprehend their great mission, and know that they are the only *syndieship* of a population, scattered, without union, without means of action, and reduced to individuality.

This mission has been understood by men, who, without speaking of their lights, possessed them in reality. We have added some technical words to their vocabulary, but we are behind them in the exact knowledge of their country. The code of

irrigation of Comtat and of the princes of Orange, the protection granted to every hydraulic enterprize, prove that in that time they comprehended, better than in our days, the springs of our prosperity: it is because then the impulse advanced from the south, from people who lived under its influence: the north did not yet weigh upon us—it had not proscribed our language and our nationality; our necessities were appreciated by those who shared them.

It was a bishop of Carpentras who caused the sluice of Caromb to be constructed. This a very small stream, the waters of which are slowly collected in winter; but at the voice of power and genius it has acquired the importance of a river. The lords of the Tour d'Aigues renewed this grand and noble example, in the neighborhood of Perthius. But where are the bishops—where the lords of our day? What patronage has replaced theirs? There is but one that can do it; this is the national association, to which we have entrusted all our means of action: it is the royalty and its government—the agricultural democracy, which protects it with its powerful egis, may also claim its canals and its basins of Lampy, and of St. Ferréol. The example of these reservoirs—of these artificial lakes, as I shall call them, is also an Italian conception; they are common in Piedmont—for it is only rarely that we can put under contribution the water of great rivers which occupy the bottoms of valleys; it is only by long and expensive works that their services can be borrowed; it is always from their tributaries that irrigation is demanded; it is not the Po, but the Adda, the Adige, and the Ticino that water Lombardy. Their current is more rapid; it comes more immediately from the mountains. So, except in some cases, it is not from the Rhone, notwithstanding its constant current and the acknowledged quality of its waters, that we shall demand our irrigations. It is from those torrents that rush from our alps with a rapidity ten times that of the Rhone. On their courses we shall find the elevated levels which can conduct the water over the exhausted *plateaus* of our plains; it is from them that our ordinary lands will demand the tribute of fertility. The Lez, the Eygues, the Louvèse, and on the other side of the Rhone, the Ardèche, the Cèse and the Gardon must supply all our necessities; but it is by a particular management, by imitating, on the sources of these rivers, the works executed on feeble brooks, that they can acquire a decisive importance.

The north-west of the department of Vaucluse possesses but few means of irrigation. Concentrated on the immediate borders of the Lez, near Bollene, and of the Meyne, near Orange, the higher waters of the Lez and the Eygues are retained in the upper part of the valleys. The commencement of a canal taken out of the Rhone, below the cataract of Viviers, has not fulfilled the hope to which it gave rise. Proceeding from the immediate banks of the river—that is to say, at the descending *(declive)* part of the valley, it is applicable only to the lowest grounds; nevertheless, the country might have derived great advantages from it, if interests had been combined. But the enterprize has been left to private resources; the canal has not had the necessary size, and has not been extended above the cataract.

In speaking of so much feebleness, is not this a proper occasion to invoke the national power—the influence of the departments—the budget of the *communes?* What! canals for navigation are dug at the expense of the state, for the benefit of a commerce, of which we know not how to enlarge the basis, which is the abundance of production. Basins above are constructed to feed these canals; the departments are taxed, or borrow money, to perfect their means of transportation; the *communes* find on their budgets, theatres, monasteries, churches, and twenty thousand *hectares*, which are worth fifty millions, and which, under irrigation, might be doubled in value, cannot awaken their attention! Yet this is the base on which will be established finer roads, more sumptuous theatres, and churches more richly ornamented; for it is the base of an immense revenue. Eight leagues of canals would complete this work; two millions would accomplish it magnificently.

An irrigation, to produce all its benefits, ought not to be excessive. It should equal a sufficient rain: beyond this proportion the water would stagnate, and do more harm than good. It is the surface of the ground which should be kept damp; this condition will suffice to prevent the evaporation of the inferior moisture of the soil. Now, two inches make a good rain, three, an abundant one; and this last is the limit at which we should fix, for our climate, the mean quantity to be given at each irrigation. Every calculation not agreeing with this, would prove, either that the lands are badly laid off, or that the inundation has been made with too feeble a stream. In fact, when the quantities arrive successively, they are absorbed by the inferior strata; they cannot extend themselves over the surface. If the land is very light they are swallowed up; but when the flow is sudden, then the surface is rapidly inundated. So, to allow about three inches, which is within the truth, is 1000 cubic *metres* per *hectare*. To go beyond this limit is a proof that the current employed is disproportioned to the extent and the quality of the land. Thus, all the art of irrigating is, to throw, suddenly, and in great quantity, the water destined to complete the irrigation. A stream of water half the size of another will not irrigate, in a given time, half an equal quantity of land; but only a fourth, and still less, where the natural current is insufficient Where the aid of irrigation is procured by weak machines, basins should receive the mass of the liquid and distribute it instantaneously to the land.

According to these calculations we should require at this point of the Rhone 200,000,000 cubic metres of water, allowing 1000 metres per hectare at each irrigation, ten irrigations a year, and 20,000 hectares of land. In Italy, the value of the water necessary for the irrigation of a hectare, is from 40 to 50 francs, at its issue from the canals, and this in spite of the competition of an extended system. The value of the water of our canal would rise then, annually, to a million. To allow this wealth to flow longer to the sea, is an unpardonable neglect.

We plough too much in France. We recur too much to the strength of our arms. We must be made to understand that there are other powerful means to call forth and to create richness; and that moisture, and natural meliorations are the auxiliaries of the arms. Cultivation excites, but does not create fertility, and ends by exhausing it: and

when the proportions which constitute fruitfulness are broken, we find ourselves engaged in a calamitous career from which it is difficult to be extricated. For this reason we ought to have recourse, as soon as possible, to those irrigations which will spread upon the soil the masses of *detritus* [or washings] which are annually lost in the sea, and to profit by the increase of resources which will arise spontaneously from such an operation to establish meadows, which, in their turn, will deposite on the soil the powerful tribute of manures. Thus by irrigation, above all, we may free ourselves from the dangerous situation in which we are placed.

But however interesting may be the results to be obtained from a canal on the Rhone, it can never, as before remarked, be applied to, except for the low grounds, the margin of the river, already, almost every where, of an excessive fertility. The great object of irrigation ought to be, to fertilize, to enrich, to create the elevated, dry, stony soils, which form so considerable a part of our country, and which can expect productiveness only from irrigation and *colmatage*. It is then to other streams that we must address ourselves.

The Eygues has a course of 15 leagues, and its sources are as elevated as those of the Rhone, which has 150. Then one league of canal taken from the Eygues will give the same level as 10 from the Rhone. But the Eygues is only a torrent which scarcely suffices for the upper valleys. It fails at need; but sometimes it also rolls in its large bed frightful masses of water: the torrent becomes a river. We have seen feeble brooks from lakes. It is an inland sea which we require of the Eygues. Many *communes*, the Bois de Velage, the Plan de Dieu, the barrens of Orange, offer more than 15,000 hectares which implore its aid. It would require the disposal of 150,000,000, supposing that the ordinary stream and the current rains of the year could fill the reservoirs three times in the season of irrigation. One or more basins cubing 50,000,000 metres would be requisite on this stream.

A lake evidently had its issue at the strait of Piles in former ages. The scythe of time, or a deplorable speculation, has broken the sluice, and history does not tell us if the consuls were roused by it, or if Cicero defended the rights of outraged nature. Yet, notwithstanding the advantage of this indicated position, a new dam could not be established there. The valley above is cultivated. But from Sahurre to Saint May the country contracts, wild and uncultivated, the deep defile offers occasionally only narrow passages. It is 12,000 metres long, with a mean breadth of 400—a depth of 5 metres would give us just 24,000,000 metres. Higher up, on the same waters of the Eygues a natural lake was lately formed by the crumbling of a mountain; 72 toises of dam would produce it again. The tributary of the Oulle runs through valleys, wilder, deeper, more dammed up. In these, basins equal to the former might be found. Thus we have more than is necessary to pay to the plain the tribute it expects.

But irrigation is not the only advantage to be derived from these works. This damming up of the waters would be a means of conveyance in a country without communication, where all transportation is dangerous. These reservoirs, ready to receive the waters of storms, would moderate the sudden inundations which threaten the lower country. The perpendicular fall of the cataracts would diminish their impetuosity—fish would reappear in these waters unpeopled by the failure of the stream. On the borders of the lakes, moistened by the constant filtration and evaporation, would rise forests that would arrest the crumbling of the hills, and prevent the filling up of the beds of the stream. Finally, these fruitful valleys, embellished by the most unexpected objects, would be covered with charming seats, whither, as on the lakes of Italy, the citizens of the plains would come to support the heats of summer, and breathe a pure air. With their capital and the taste for preservation and creation which is the companion of competence, would arise the only possible culture in these abandoned districts: woods would reappear on the sides of the mountains, and thus would be commenced under every form, the work of re-construction, which it is our desire to inculcate.

But commerce will soon demand of you the works which I claim for agriculture. Every where interior navigation is arrested—the rivers are obstructed. In vain would you re-commence on their courses the labors of Ixion—your forces are powerless to remove the constant deposites which are formed in every season, day and night, at every hour. You must attack the beginning of the evil, and this evil is in the upper valleys. You must prevent the invasion, and you will not have to combat it. You will have no rivers till you have lakes. These make powerful rivers, and regulate their streams; and the Seine under this system would cease to be the sewer of a province—would become the most noble ornament of the capital, and our national monuments would be reflected in the crystal of its waves. Thus commerce and agriculture have here, as every where, the same interests.

The commencements should be made on the Eygues, because an interesting and varied country lies at its feet, and we should obtain immediately a number of comparative experiments on different soils.

The banks of the Louvèse are cultivated quite to its source, but the Toulourenc, its chief tributary, offers a narrow defile, confined by immense perpendicular rocks. Ten toises of works would form a considerable reservoir. Causans, Violes, and Courthezon would thereby obtain a more regular and extensive irrigation. Happily for the districts below, the Sorgues meets the Louvèse and contributes the aid of its inexhaustible waters; but I believe that it would be better to establish the works on the Eygues, and a canal of a league below Cayranne would unite the waters of the two rivers, and satisfy all demands.

But we can speak of irrigation in the south of France without thinking of the country which occupies the lower part of our basin, of that country which fixes the attention of agriculturists, the Delta of the Rhone? Like the Delta of the Nile, it cannot realize all the advantages of its position except by a vast system of irrigation. Salt is crystallized there by the rays of the sun, and proscribes useful vegetation; but as soon as fresh water touches this soil, the most vigorous fertility hastens to display itself. Nor have schemes for its improvement been wanting: some, and with reason, have invoked the steam engine; others have seen only the Rhone which rolls its immense mass

of riches at their feet, but it is necessary to seek for elevated levels, and these are distant. In the small rivers, which rush more immediately from the mountains, might be found available upper levels; and whilst we should be obliged, on the Rhone to seek them at Viviers, and to overcome all the obstacles of a * * country, the Gardon, at 17 miles from the head of the Camargue offers a sufficient height to conduct its waters over the country. We must imitate the examples already given, and collect in winter in the depths of the valleys those waters which are to refresh the heats of summer.

The Gardon might form three great basins of irrigation, two above in the uncultivated valleys which it traverses in the Lozère, at the Gardon d' Alais and d'Anduze, and a third below, placed as a regulator, between the bridges of Saint Nicholas and of Colias: the length of this last valley confined within perpendicular rocks is more than 12,000 metres in a right line, but as its direction is very tortuous, and the river there follows a series of windings, many of which are at right angles, its actual length may reach 20,000 metres: estimating its mean breadth at 400 metres, and allowing a depth of 5 metres, we should have the mass of 40,000,000 cubic metres of water contained in this single basin; and supposing besides that it might be filled three times during the continuance of the irrigations, we might, on this one point, dispose of 120,000,000 cubic metres of water. The upper basins would, together, easily present the same results. We should have then at our disposal 240,000,000 cubic metres of water. This irrigation then, according to our calculations, might be extended to 24,000 hectares of land.

The Camargue is about 30,000 metres long, with a mean breadth of 15,000: it contains then 45,000 hectares, from which if we take off the immense pond of Valcarès, and the marshes, which in their actual state give a product which it is not desirable to alter, we see that the mass of liquid contained in the reservoirs will answer all necessary purposes.

This water would have a selling value of more than a million, but this value would be tripled in the profits of the proprietors who should use it on their lands: thus, then there are three millions of revenue which the Camargue may demand from the Gardon. This is the future promised to those who shall have to make three principal dams, some works (diaphragmes de sûreté) for the safety of the lower districts, six leagues of canals, and an aqueduct bridge over the small branch of the Rhone.

This would have been the proper commencement, if it had been seriously contemplated to rear a breed of horses in this isle, and to find here those military resources which have been so long sought: an abundant nourishment would have created a strong and numerous stock. In the Camargue might have been found those active horses which constitute the superiority of the Numidian race. I join in favor of my system this consideration to those which will be urged in my writings; arguments should be adapted to every mind, and he who would not dare to reconstruct Egypt, and to seek his examples so high and so far off, may wish, like Austria, to have his Buckowine, for remounting his cavalry on a limited space; to be able, for this reason, to impress on the individuals a more regular and more nervous character, and to profit by a singular combination of soil and climate to cause the Arab to bound over our territories; where may be found at once the immensity of the Desert, the Egypt of the Delta, and Arahia Petræa.

By extending the works on the Gardon, (and the margin is immense on the upper valleys,) Nismes, which sighs for water, disinherited of the works of the Romans, might, by constructions, worthy of its founders, worthy of that municipal wisdom which distinguishes its administration, have recourse to the same sources; the verdure from waters poured into lakes would adorn its industry.

But there is a river which we could not pass in silence without leaving incomplete the plan which we have traced out for ourselves. The Ardèche is loaded in its course with the most precious deposites. It flows over volcanoes: pumice stone floats upon its waters, and potash is dissolved in them: but scarcely freed from its narrow bed of rocks, it is precipitated into the Rhone, bathing some islands fertilized by its incomparable alluvions. On its course, the developement of basins would be immense, it is necessary to seek the employment of its water. But it has a great part to play: it may pass over the Rhone—an aqueduct bridge can place it next to the Pont-St. Esprit, and to mingle its waters in the plains of Vaucluse with those of the Rhone and its tributaries, of which we have already described the power. It is from the simultaneous aid of so many elements that we shall acquire, better than from irrigation, the varied alluvions which will create the most perfect of soils. The sand of the Rhone, the calcareous clays of our alps of Dauphiny, the volcanic matters of the Ardèche will unite to effect miracles of vegetation. Thus, blind chance, will no longer dispose of the theatre of our agricultural industry—we shall call upon the soil all the combinations advantageous to its cultivation, at our voice, the weak or the strong, the stiff or the light, obedient to the inspirations of genius, their forms and qualities will be modified under our hands. We shall establish our empire no longer over a vain extent of surface, but over docile elements ready to receive a body and a life. No longer with the sweat of the brow, and the cracking of whips, the sand and the marl will come to be united on the fields—but by the simple current of the brooks, with the murmur of the cascade, under a cool atmosphere, in the shade of the greenest foliages, in the view of an exalted nature, of a regenerated land, which will come to attest that a new era has commenced; that man henceforth is associated with creation—that he is no longer an exile living in proscription, axe in hand, but the lawful heir, and that the hour of redemption has struck.

I can here only indicate, without describing the works; so many elevated considerations rush into my mind, in the perspective of a possible futurity of which the results overpower me, that I cannot find a moment to devote myself to those considerations of description which ought to precede them. It would be a great and useful task to fix upon and describe the places, to give the levels, to ascertain the dimensions of the basins, and point out the means of construction: but at present it would become fatiguing to follow the course of our torrents,

to remount, step by step, the valley of the Rhone in all its extent. Every where the same necessities are presented—every where a burning sun darts its rays—every where a lofty river rises from the summits of our mountains and wastes the soil—and every where the earth implores the succor of the water. In no place has the primitive integrity of the country been preserved: all those tributaries which rush from the mountains roll their waves under the same conditions. Rapid at their sources, they relax in their course, and are joined to the ancient bed of a lake whose dam has been broken down, whence they dash again in falls and rapids to reach their point of confluence with the river. A uniform law rules their destinies. The same circumstances are met with every where at the Roubion, the Drôme, the Vela; they must be studied and made to concur in the primitive reconstruction; this is the great task imposed on modern civilization if it wishes to advance in the progressive steps of comfort.

To feel all the importance of the works we have intimated, we must be convinced of one great principle: this is, that the productions of the soil are the surest source of the wealth of nations; and that these productions are never more abundant than when the moisture of a country bears a just proportion to its heat, so that moisture by heat is equal to vegetation. These two agents then, and their exact proportions, ought to guide rational agriculture in its operations, and the labors which should go beyond the balance of these forces would be unfruitful toils, and would produce only imperfect results like those on which the energy of man is now vainly lavished.

Where heat is wanting the task becomes difficult. We are thrown into the system of shelters, hot-beds and green-houses: we become gardeners. But where moisture only is deficient to the soil, an immense career is opened to the cultivator. Water is there superior to all combinations. This then, is the great principle; with the more energy these two elements united display themselves, the more exact will be the proportion of their forces, and the more completely will the vegetable kingdom be developed.

Under the tropics, deluged with rain, and burning with the beams of day, plants succeed each other without interruption, and give the maximum of vegetable richness: near the poles, or on the alps, a weak and short turf, with some plants in miniature, mark the last step of the ladder. Between these two extremes, all countries rationally managed, ought to range themselves in the order of their fertility and power, according to their latitude; but when the proportion is broken; when one of the conditions of prosperity has failed, it is in vain that the labor of man appeals to a condemned soil. Heat without moisture, makes a desert—moisture in excess, a marsh: disinherited lands, countries where the human race seeks in vain to establish itself, or where it struggles incessantly against nakedness and disease.

England, Belgium, the north of France, seem placed in that position where the natural equilibrium is established—where the climate dispenses moisture and heat in an exact proportion. It is this circumstance which has placed these countries at the head of modern civilization, a developement which owes nothing to intelligence—a fortuitous creation, into which man has entered but by the concurrence of his physical strength, but which has, nevertheless, placed those countries in advance of the southern nations, which have not sought to balance their means. But yet a moderate heat, a moderate moisture will have unfolded only a middling position, on the day when the south shall assert its advantages; for, where the heat is excessive, where means wisely prepared can proportion, on a large scale, the two principal agents of vegetation, there a superior developement may be expected.

I have seen vexation painted on the faces of Englishmen on beholding our rich meadows. The islander in his calculating mind, reckoned up in silence these brilliant productions; he made a bitter reflection on his northern temperature; he saw with a practised eye the state of the question; he estimated the power that would one day spring from this disposition of soil and climate.

But if the north enjoys these advantages naturally—if the seasons prepare for it all the amount of wealth of which it can dispose—if it owes to the exact proportion of the constituent elements of production its actual superiority—the south can look for its entire developement only from peculiar labors which the circumstances of its latitude render indispensable. Two of moisture, multiplied by two of heat, make four; but four of moisture, multiplied by four of heat, make sixteen. The first is the north, the other the south, when it shall have accomplished its task. Yet, this south is vast; the line which circumscribes it is not yet well traced out; it oscillates within large limits, and Poland languishes this year, like a desert in Africa: the cattle are dying there on the withered herbage.

An Englishman once came to consult me about an estate which he had in Cornwall, the warmest exposure in England: he wished to have grapes. My answer was this: make shelters, blacken the soil and the walls of your terraces, carry out dark colored stones; but if I could have said to him, you have a reservoir of heat, open a flood-gate of fire which will temper your frozen climate, with what joy would he have returned to his country! With what zeal would he have set about the work! And we, with our pressing necessities, under our brazen sky, on our petrified soil; we, who have only to stoop and take what providence has spread every where, we indolently use some threads of water bequeathed by Italian civilization. We stupidly try a plough, or an English course of tillage: we waste ourselves in puerile trifles—we exert an immense energy to run like madmen in a ruinous circle of labors and insufficient productions, and yet we know where the treasures are concealed—where are the arms to come out victorious from this strife of slaves.

In surveying the astonishing changes effected in the value of the soil by a process so simple as irrigation—in seeing this meansso to speak, put within reach of all, and so foolishly despised, we are tempted to demand where is this human intellect of which we are so proud—where is this civilization of which we always believe to have reached the limit? The intellect is lost in vain combinations—it has known neither how to foresee, nor to prepare the future; the civilization must be reorganized, for it has been bequeathed to us by barbarians; it pursues wealth which a false system cannot produce. The labors of which Egypt

still bears the impress, those of which we meet with the traces in Persia, and which announce a vast system of irrigation, tell us that a great power was formerly established upon the creating principle we invoke: and the ruin of cities, and the misery of nations, which wander dispersed over canals filled up or broken down, tell us also that this principle alone had invigorated so much force. This principle, derived from the borders of the sacred rivers, from the gardens of creation, from Druidical veneration, from the woods—what say I? From all that ancient wisdom had accumulated of conservative ideas to defend the nobleness of the world from the assaults of barbarism, trampled upon now by organised brute force, has left only those vestiges which are the lessons of nations, and which, in huge characters, unfold the future. All ancient prosperity, all southern civilization, which have acquired any solidity, repose upon this rich system of irrigation; in Egypt, as in Persia, as among the Romans, who consecrated so many cares to hydraulic labors, and among whom, as we have seen, their greatest orators and statesmen pleaded for the dew of heaven, and the moisture of the fields.

It was the recollection of antiquity, it was the middle age, the depository of its traditions, which placed upon our soil this germ which I now wish to develope. What stopped its progress was that a new civilization, springing in its turn from the shores of the Baltic, entirely founded on force, hoping nothing from the ingratitude of the soil, but confiding in the energy of man, came to crush the ancient civilization, and that the customs of the north have finally prevailed and stamped their character on the rest of Europe. This influence has been fatal to the south—it has led it astray in the labyrinth of modern industry and artificial processes, to make it abandon the vast, calm, and fruitful system bequeathed to it by the east.

Thus may be explained, the resistance and repugnance of our husbandmen to adopt the foreign plans which modern theories would propose to them. A vague traditional sentiment recalls to them their fallen nobility: they know that they belong to a civilization different from that which has been imposed upon them; the pride of the Gascon has no other origin. It is in vain to propose to our peasantry, the most perfect rotations, aided by the best implements: they know that they might have better than that; and when in their wishes, until now powerless, our governors have allowed a glimpse of the possibility of a canal of irrigation, when preparatory works of leveling have been ordered, how the popular sympathies have crowded around the fertilizing idea! It is because, although the irriguous cultivation exists only in patches, although it has as yet employed only feeble means, yet enough has been done to show the superiority of this system over every other. From this we obtain a steady moisture proportioned to every climate—manures without care—combination of soils without expense—productions without labor—the *heart* and clearness of the land without tools—wealth and repose—material life and intelligent life—springing from the same source, and coming to take the just proportions which they ought to have in every well ordered social body.

There is no culture which does not derive advantages from irrigation; all, in different degrees, claim its aid. Watered trees take a rapid growth. It is on the moist lands of our islands of the Rhone, on the banks of the Durance, at the bottom of the valleys of the Cevennes, and on the borders of the brooks, that the mulberry acquires those prodigious dimensions which raise its product to 15 and 20 quintals of leaves. The trees, in this position, do not undergo that waste of sap which, in the heats of summer, arrests their vegetation, and makes them languish; their growth is the more rapid, as a constant moisture is combined with a more excessive heat.

But it is in the productions of meadows that the relative forces of climates are manifested. It is in their cultivation that the south can assert all its advantages. Grain in the south, as in the north, ripens under certain conditions of heat, which, once accomplished, produce maturity a little sooner or a little later, according to the latitude; yet this does not occasion a great difference in the actual product. But in a continued vegetation, as that of meadows, the grass grows as long as the heat continues and moisture accompanies it. Thus are obtained, in proportion to the climate, a number of mowings, which determine exactly the power of each country. These advantages are the results of irrigation, which equalizes these agents, when a regular moisture, induced by the intelligence of man, constantly joins its effects to those of heat. The seasons may be irregular and unsuitable even in the best balanced climates, but the reservoirs of fertility placed in the skilful hands of man will proportion the help to the need. With us the regular element is heat: this is ascertained from the fixed times of our harvest; but it is beyond our power. The irregular element is rain, which varies as from one to three, but it is for this uncertain element that we are able to substitute the certainty of our action.

I think I have left no doubts on the effects of irrigation. It triples our means—it increases them ten-fold, a hundred-fold, according to circumstances. To extend it over the whole surface of our plains, of our valleys, of our elevated table-lands, would be to introduce into the country an abundance till then unknown: it would be to change radically the basis of our existence, the nature of our labors, our social relations. Let us seek to lift the veil which covers this future: let us dare to sound the depth of the problem, and demonstrate that in it only reside those blessings which we seek by other means, equality, liberty, peace and physical redemption.

From the Southern Agriculturist.

ON THE USE OF PISE IN CONSTRUCTING HOUSES AND FENCES.

Columbia, (S. C.) Sept. 1st, 1835.

Dear Sir—You will see by the resolution, a copy of which you will find here below, that you are requested to publish the accompanying "Address to the Standing Committee of the South Carolina Society for the advancement of Learning and the Diffusion of Knowledge."

N. HERBEMONT.

At a meeting of the Standing Committee of Twelve, held on the 31st of August, 1835, the following Resolution was passed.

Resolved—That the Memoir on Pisé work be transmitted to the Editor of the *Southern Agriculturist*, with the request that he print it in his journal; and the Editor of the *Telescope* be requested to reprint it from the same.

To the Standing Committee of the South Carolina Society for the Advancement of Learning and the Diffusion of Knowledge.

Gentlemen—The great zeal exhibited at the last meeting of our society augurs well for its ultimate success in the furtherance of its objects, and the readiness with which gentlemen are subscribing for a fund for the purpose of erecting a suitable building for the accommodation of the society, is a sure guarantee of the determination to persevere in so laudable an establishment. It has for its object the advancement of learning and of useful knowledge, based on the best established scientific principles. It would be vain to attempt to show the great benefits which our country is likely to derive from a zealous pursuit of the objects in view. These must be incalculable, and we shall not be disappointed, let our expectations be ever so great; so that they are only within the bounds of practicability, if any thing approaching to the ardor now witnessed be persevered in.

As it seems that the first and principal object desired to be effected, is the erection of a suitable building for the accommodation of the society, I beg leave to be permitted to make a few observations that will tend to render this, our first act, as eminently useful as its nature admits. So far as it is possible, every step of such a society should be attended by a benefit rendered to the public. We expect, of course, that a building for such a society will be constructed according to the best models of architecture within our reach, and to join to the suitable convenience of its object, a specimen of pure and classical taste. Economy is one of the great requisites of great usefulness; for without it, it could not serve as a model and a lesson to the private citizen which he could prudently follow. I conceive it the duty of such a society, as this, not only to lead the taste and fashion in all that is elegant and useful; but also in the most economical methods of attaining these valuable objects.

There is a mode of constructing houses of various sorts, and also walls of enclosure practiced in various parts of Europe, particularly the southern parts of it, and also in South America, which, if it were exhibited to our citizens for their imitation, would most probably be attended with the most extended benefits, both in town and country. This, in parts of the country where rail timber is either scarce or of bad quality, would supersede our rude, inefficient and insecure common rail fence, by a substance durable, cheap, and found, with very few exceptions, every where, where a fence or a house may be wanted. This substance is *earth* neither too clayey or too sandy, beaten down by a rammer between two planks till it is of a sufficient degree of hardness, which it very readily acquires. This mode of construction is called *Pisé*. There is not, perhaps, in the world, a place more favorably circumstanced for this kind of work than our town of Columbia. The red earth which is found here every where after digging a foot, or even less, is the best possible for it. Any kind of earth, however, will do, so that it be not a pure clay or a pure sand, and that it contains no vegetable or other putrescent substance. The usual test for it, is to take a handful and press it, and if it sticks together retaining the impression of the fingers, it is good. It is better to have much more sand than clay; for clay renders it liable to crack in drying. It may be full of gravel, pebbles, or small fragments of stone. It requires no addition of any thing, even water, nor any other preparation than the digging of it, and the carrying it where wanted. I beg, gentlemen, you will not mistake this Pisé with what is called "mud houses or walls." No, it is very different and very superior, yielding only in strength and durability to the very best work of stone or brick, done with the best skill and the best lime-mortar.

This mode of building is not a new, untried thing, the practicability and benefits of which may be fermenting in the brains of some visionary man. No, it has been transmitted from generation to generation, from the time of the Romans, into the principal parts of the southern provinces of France, and also in Spain; from which last country it has been transported and rendered most extensively useful in South America. It is the subject of a very full article, in a work of great authority, the "*Cours Complet d' Agriculture*," by the Abbé Rosier, assisted by some of the most scientific men in Europe. I have seen, in the vicinity of Lyons, houses and churches which are said to be between two and three hundred years old, which had been contructed of Pisé. Indeed, many of the richest inhabitants of that city have their country houses, palaces we might almost call them, erected with Pisé. You can also, any of you, gentlemen, have an ocular demonstration of the practicability of the thing, by riding with me to my place in our sand-hills, where I put up very hastily and unskilfully about four years ago, a small building, sufficient, however, to show the capabilities of this mode of building.

I do not propose that the principal edifice for the accommodation of the society be constructed in Pisé work; for, although I believe that it is capable of forming structures equal in beauty and durability with the materials usually used here, we have not yet workmen sufficiently skilful and experienced for such a purpose. I only intend to recommend the erection of out buildings and walls of enclosure for the present. These being erected in a conspicuous place, such as you will undoubtedly select, will be models for imitation from which the public will derive incalculable benefits.

Such are the facilities offered by this mode of construction, for fencing-walls, in Columbia, for instance, that the materials can be taken from the street to make an enclosure about six feet high, and thereby improve the street by giving it the usual form of being raised in the middle, forming drains on each side for the flowing off of rain water, &c. This thing must necessarily be economical and cheap; for the materials are usually found on the spot, requiring no hauling, and so easily executed that common laborers, under the superintendance of a tolerably intelligent man, are equal to it. The only expense attached to it is a thick wash of sand and lime put on the wall with a broom, (and my experience shows that this operation may be delayed for years without injury) and a coping of suitable materials. Stone is, of

course, the best, tiles and bricks next, and wood. Poor people use turf, others straw, cut of a proper length, laid across the wall on the top, and kept down by earth. This has the double disadvantage of not looking so well and of requiring to be renewed every five or six years; although this is sometimes neglected for ten or twenty years, with no improvement in beauty, certainly; but without as great a change as could be expected from such culpable neglect. I have read an account of a wall several miles in length, in South America, which had been without a coping for more than sixty years, and yet it was standing and available. A wall of this kind carefully constructed, rusticated with the lime and sand wash, with a coping of durable materials, will stand pretty nearly as long as the earth on which it is erected, and of which it is really a part. As it has been used without any admixture, it must necessarily be incorruptible.

The question of the cost of such a work is worthy of inquiry; but it cannot be as expensive as a tolerably good looking wooden fence, which will not last twenty years, after having been continually repaired for the last half of that time.

Six workmen (negroes) is the best number for a set to work together, (and several sets may be under the same superintendant) can construct in one day three square toises of Pisé, that is, a wall six feet high and eighteen feet long; seventy-five cents per day, as the cost of each hand, is a very full allowance, as some of them, the carriers, may be inferior. This makes the expense of such a wall, independent of the wash and coping, $4.50 per day. This requires then about ninety-two such day's work to enclose a square of four acres which make $414, which is less than a good post and plank fence can be erected for. The cost, as specified here, is in reality much more than it would be in most cases; for this is reckoned at the price it would cost by paying the hire of the hands: wheras such work would be usually done by the plantation hands. If it be, however, desired to make a comparison between a fence of this kind and one of any other sort, the labor of the hands must be valued at the same price for the common worm, or post and rail fence, not forgetting the hauling; but, for any timber fence of a superior grade, the cost should be estimated by the price of carpenter's work, besides the cost of materials.

For a house, the foundation should be laid in stone or brick, in order chiefly to intercept the moisture arising by capillary attraction or otherwise, which might injure the building. The structure, in Pisé, commences then about one foot above the surface of the ground, and may be continued as high as with brick, with perfect safety, and the materials for it are taken on the very spot by digging a cellar. If the house is a mere outbuilding, such as a kitchen, stable, servant's house, &c., it is usually rusticated, as was said of the wall; but, if intended for a large and handsome house, it is rough cast, and any ornament may then be added to it. The pounding of the earth to form these walls, &c. so incorporates the whole into one mass, that, if the work has been well done, it may be said that the building is of one solid piece, and is undoubtedly more strong, firm and permanent than a brick house, unless the bricks are of a very good quality, and very carefully laid in the best lime-mortar.

There is much land of great value in the neighborhood of towns, the culture of which is sometimes abandoned on account of the scarcity of timber and its short duration, which renders fencing in such situations very expensive. All such might be enclosed with a Pisé wall at a comparatively small cost, and would make it worth while to make in the soil of such enclosed land, such improvement as would render it of permanent fertility, for which a large town always furnishes abundant materials.

The above is respectfully presented to the Society, with the desire that the subject may be treated with the attention which it deserves, and with the assurance that the writer is perfectly satisfied of the great and incalculable benefits that must necessarily arise from the adoption of this mode of constructing houses and fencing, wherever it is practicable, and that it is so, probably, in a majority of places.

I neglected to observe in the proper place, that the amount of work estimated as the usual day's work of a set of six hands, is for the building of houses, the walls of which are usually nearly double the thickness necessary for a fence, and that, therefore, such a set of hands can most probably make a great deal more of the very plain work required for a comparatively thin wall. I leave, however, this estimate as it is, so as to have it at the highest cost possible or probable.

Respectfully submitted by

N. HERBEMONT,
Chairman of the Committee on Rural Subjects.

From the Horticultural Register.

KEEPING CABBAGES IN WINTER.

The principal gardener in the Shaker establishment in New Lebanon, Columbia Co., New York, directs not to pull up cabbages in autumn "till there is danger of their being too fast in the ground to be got up. If there happens an early snow it will not injure them. When they are removed from the garden, they should be set out again in the bottom of a cellar. If the cellar is pretty cool, it will be the better."

From the American Gardener's Magazine.

ON THE CULTIVATION OF THE TULIP.

The season for planting bulbs being at hand, and presuming that some remarks would not at this time be unappropriate, particularly in regard to the flowering of the tulip, I with pleasure send you the following, which will be, perhaps, of some interest to your readers, and extend the cultivation of this favorite flower.

To attempt to describe this lovely genus, would, I humbly conceive, be an insult to the common sense of any community. The beauty of the tulip flower draws the attention of the most careless observers, and as it were, makes itself known to them at once, because it is one of those kind of flowers, when taken notice of, is rarely or ever forgotten. The Dutch are famed through the civilized world, for their splendid collections; inasmuch as some of their private ones have been valued at

some thousands of pounds sterling. In England I have had the care of tulip bulbs, that were valued from *five shillings* to *five pounds sterling*, a *single bulb;* this is, perhaps, one reason why we so seldom meet with a choice collection in this country; the first cost being so great, and the time it necessarily takes, to give them proper attention, is another considerable item with those who have business to attend to, and who have but a small portion of time to spare, in the care and production of elegant flowers. Nevertheless, there are persons in every city who can afford to spend both time and money in such pursuits; but by not understanding the nature of them, are prevented from making the attempt. In order to do away with this difficulty in part, I will engage to give them all the knowledge I have on this subject, which will cost but a trifling sum, compared to the years of time I have been collecting it together.

Those persons who are desirous of obtaining a good collection of tulips, should, by all means, make their selection from some of the established seedsmen or nurserymen; for, to trust to the bulbs that are sold every year, at the *auction* rooms, in nine cases out of twelve, they would be deceived; therefore it is highly recommendable, to make the selection from persons of established *credit*, even if the cost is four times as much, rather than to run any hazard. Supposing the bulbs are on hand, the first step is to prepare for planting: the compost should be a mellow light earth, or leaf soil, (the top spit of an old pasture field,) preferring it rather light, than of a strong binding nature, and well rotted stable manure, blending the whole well together. To three wheel-barrow loads of the soil, add one of manure, and so continue on, until there is enough mixed for use. This will be found to be an excellent compost for the growth of the tulip, if it has been thoroughly made. The beds should be four feet in width, and from twenty to thirty feet, more or less, in length; preference should be given to a plat of ground that is well sheltered from the north-west and easterly winds, observing to keep away from the shade of large trees as much as possible. Having decided upon the location, go to work, and throw out the whole of the surface and under soil, to the depth of two and a half feet, taking it away to some convenient place, leaving the bottom of the bed nice and level; then look out for some good stable manure, about half rotted, for the purpose of laying at the bottom, about six inches thick; this will leave two feet in depth for the compost; this may appear, to some people, altogether superfluous; nevertheless, it ought to be done, for this reason; the manure will be in an excellent condition for mixing with the soil the succeeding year. I shall here observe, that it is not necessary to prepare a fresh compost every year, after such an one has been made as here recommended. If the operator thinks the soil ought to be renewed in some degree the second season, a portion could be taken away from the bed, and replaced with some fresh compost, and so on year after year, never neglecting to place the manure at the *bottom* of the bed, as before stated: to do this properly, begin at one end, and take out the whole of the soil, until you come to the bottom of the bed. If it was made four feet in width, take four feet in length; this will leave a trench four feet square, and two and a half feet deep; wheel the soil thrown out, to the other end of the bed, in order to finish off with. The manure should now be laid at the bottom at the depth proposed; mark off again four feet in length, and place the top spit immediately on the manure, continuing so to do, until you have a similar trench at the other end; this will completely change the compost every year, by bringing the under soil to the surface, which is of great importance—level off with the soil which was wheeled to the opposite end of the bed from where the trenching was begun.

But to return to the planting of the bulbs the first year. I shall suppose the bed or beds are already filled up with the compost a little above the level of the ground; allowing it to settle to the original level: this ought to be done the first week in November; the second week, have the surface of the bed raked perfectly smooth and even; then stretch a line tight and straight the whole length of the bed six inches from the front side, and with a small piece of stick mark off close to the line; remove the line again six inches, and mark off, and so go on, until you have six straight lines the length of the bed; this will leave six inches clear, both at the front and back; then mark off across the bed, six inches apart; this will leave the whole of the bed in six inch squares. At the angle of each square, or where the lines are crossed, place a handful of sand. If the day is fine, go to work and plant the bulbs immediately, for there is no trusting to the weather, at this season of the year. Place a bulb in the centre of each handful of sand that was put there for this purpose. When the bed is planted, cover them with a compost similar to that they are to grow in, three inches deep; observe to mulch the beds over with leaves or litter, about six or eight inches, before the approach of severe frosts; it is also indispensably necessary to have a light frame built over the bed, for the purpose of fixing upon it a light canvass, or strong cotton cloth, to shade the flowers from sudden storms of wind, rain, early frost, and particularly the hot sun. In the spring of the year, some tulip growers make use of hoops bent over the beds at regular distances, and throw over bass mats; but a permanent frame would be but a trifling expense, and is much to be preferred. As to the size of the frame, every one can suit their own taste in the dimensions of it; all that is necessary is, to secure the plants and flowers from the before mentioned casualties. Take off the covering of leaves, &c., in the spring, as soon as the plants begin to make their appearance, and with a trowel or small fork, stir up the soil a little between each row, and leave the whole smooth and neat; now begin to make a quantity of small neat stakes, about two and a half feet in length, for securing the flower stems to, beginning at one end of the bed, and placing a stake in the centre of the four first plants. Procure some lead wire, and twisting it once or twice round the stake, you will find that there is only three inches to go to reach the flower stems of four tulips; twist it once round the stem carefully, leaving room enough for it to play about easy; thus it will take three stakes to secure twelve of the flower stems, which, if neatly done, will have an elegant effect. After flowering, the tops will soon begin to decay; and when yellow, or dead, the bulbs ought to be taken up and laid away from the sun to dry a day or two; then clean and place them in a dry room,

there to remain till the time of planting; look over them occasionally, to see that they are all in good order.

Tulips are known by the following names: *early tulips*, which flower about a fortnight before all others; *bizarres*, which have a yellow ground, striped with brown, purple and violet, with intermediate shades; violet and rose *bibloemens*, which have a white ground, striped with violet, purple, black, cherry, rose, and intermediate shades: these are considered the most valuable by the florist; *baguets*, which are nearly allied to bibloemens, but are much stronger in their growth, and more gross in their colors; *double* and *parrot* tulips are esteemed mostly as border flowers.

Yours,

J. W. RUSSELL.

Mount Auburn, Cambridge, Oct. 12th, 1835.

EXPERIMENT OF ASHES AND GYPSUM AS A MANURE FOR CORN. PLAN FOR MANAGING TOBACCO PLANT BEDS.

To the Editor of the Farmers' Register.

I promised (in due time) to send you the result of a small experiment on the application of plaster and spent ashes to corn, mixed in the proportion of one-third plaster, and applying a single handful to each hill of corn. I have now gathered and measured the corn on six acres—which was all I could manure in this way, in consequence of the want of ashes. The result is, forty-nine barrels and a half on the six acres. It is proper to state, that the land was very poor—a part of it had been cow-penned during the previous summer; another part was a complete gall, without soil upon it, and a small part, (less than an acre,) the margin of a branch. I do not believe the six acres, without the plaster and ashes, would have made fifteen barrels, even in this favorable year—the corn adjoining this, on similar land, being an indifferent crop, though it received precisely the same cultivation. Nor have I a doubt that I might have had nearly double the crop on the six acres, if I had doubled the quantity of hills, as the stalks are universally large and luxuriant—larger than I ever saw on high land. Although this result falls far short of the produce in Maryland, under similar treatment, yet I am well pleased with it—having trebled the crop I had hitherto expected to reap from such land; and I have now no doubt, that where ashes are attainable in sufficient quantities, the crop of corn may be always doubled at least—perhaps in most cases on poor high land, quadrupled. It may be necessary to state, that my six acres were laid off in horizontal rows, five feet and a half apart, the corn being dropped in the row at intervals of about three—one stalk generally in a hill, occasionally two. It received but two ploughings and one hoeing—but would have been much benefited by another ploughing, which I would have given it had my other farming operations permitted it.

I have thus, Mr. Editor, redeemed my promise to give you the result of this first experiment on the use of plaster and ashes combined. I am not chemist enough to know whether the combination of the two, produces a stronger manure than either alone; of this, however, I am certain, that no use of plaster on my plantation has ever produced so great effect as this combined use of plaster and ashes.

Whilst I have the materials for writing before me, I will add a piece of information for the benefit of your readers who make tobacco, (doubtless known already to many, but which others may profit by—) on the rearing of early and good plants. I have tried the method I shall recommend, for three years, with entire success; so have others of my neighborhood. The plan is exceedingly simple and easy of practice, viz: to underlay the plant bed previous to sowing it, with tobacco stalks, covering them about three inches deep with earth. This may be done by the plough, where the bed is clear of roots and stumps, or else with the hoe, by digging trenches parallel to each other, and nearly touching each other, until the whole bed is gone over, filling up the last trench dug (after pulling therein the stalks) with the dirt that comes out of the next. If a plant bed thus manured fails, every body else in that neighborhood will certainly fail too, to raise plants that season. Mr. Old of Powhatan, (whose reputation as a tobacco maker, stands so deservedly high,) tried this plan last spring with the most perfect success.

H. M.

Nov. 13th, 1835.

THE FARMER'S PROVERBS.

To the Editor of the Farmers' Register.

Most of the ideas contained in the following piece are familiar to old farmers and house-keepers. I have adopted this mode of writing to notch them deep on the minds of the juniors. A sentence short in construction remains longer in recollection. I have not prepared my bits for fine scholars, but for plain farmers—not for reading men, but for working men.

A lean wood-pile makes a fat grave-yard.

If you feed low, you must work slow.

Clean out your spring often, if you would see the doctor seldom.

Small cabins make large grave-yards—much filth, much physic.

Feed well, and you will breed well.

Smooth gear makes smooth ploughing—when the collar chafes the skin, the plough won't go in. The horse sweats least when the gear fits best.

An empty belly makes a sore back. The saddle is damned when the fault is in the feed. Good feeding makes the best padding.

A neat floor is an enemy to flies—but a dirty one is a friend to fleas.

A foul yard invites sickness—but a neat one chaseth away fevers.

A neat cook makes a neat kitchen, and a neat kitchen makes a neat table.

A weak fence makes a strong foe—but firm stakes make firm friendships. Fence in your stock if you would fence out the devil. One bad sow will make many bad quarrels. A sow that has lost her ears should also lose her life—for among the overseers she'll cause a deal of strife.

Bad shoes in winter make bad coughs. Mend your shoes and break your colds. Every new stitch in an old shoe saves a penny in a new bill. A penny given to a coarse shoemaker is a pound taken from a fine doctor.

Fleas in the cabin will make grass in the corn-field—for he that catches fleas by night will catch sleep by day. Where the laborer is asleep there the grass is awake. Dull licks make brisk weeds.

A mean overseer is a plantation cancer: immediate excision is the best cure.

An overseer's cow makes the best beef, but her calf the poorest veal.

The employer's family drink blue milk, but the overseer's children spoon up cream, and butter lieth thick on their bread. His cow findeth the way to the meadow and the hay that is forbidden—she eateth thereof—her bag is swollen, and her teats stand out—she letteth down her milk, and the piggin overfloweth—daily her churn foameth, and her rich butter is gathered into the plate. She is never found in the mire, nor doth the hollow-horn find her out. She is the queen of the pasture, and her horns are the terror of the cowpen. Many cows have given milk, but she excelleth them all.

Home weaving overgoeth, but that done from home lacketh filling. There are some who are without sheep, yet have plenty of yarn, while they that have many sheep lack wool.

There are some who have an empty meat house yet a full pot—an empty crib, yet a full oven. They spin not, yet are they clothed—they toil not, yet are they fed. Their horses graze, yet they have no pasture—and their cows calve without a bull. Their mares foal without a stallion. This is a sore evil under the sun.

Others there are that find tools that were not lost—pick wool from dead sheep—pull down fences they built not—gather fruit from other men's trees—that go on errands where they have no business—that thump your melons with roguish fingers, and open them too by the light of the moon. They are the *republican night-walkers*—aristocracy haters—too free to work—want all things in common, as they have nothing in particular—hate those that have, because they have not. They never beg—ever buying, but never paying—never failing in promises, but ever failing in performances—too proud to work, but not too honest to steal. This is another great evil under the sun.

A new hoop saves an old tub, but new cider will burst an old barrel.

Build no new nest out of old straw, for instead of brooding eggs you will be breeding lice.

Never over-cock your poultry yard, for where there is much fighting there is but little gain.

A nest without the house is better than a nest within—for lice within are worse than rain without.

Take care of poor spots and the rich spots will take care of themselves. "He that giveth to the rich robbeth the poor, but he that giveth to the poor shall be repaid."

He that tilleth very poor land sendeth good corn after worthless *nubbings*. Poor land receives good currency, but pays bad money. It borrows hard money and pays back bad paper.

Provide fuel for summer, and winter will take care of itself—for winter is a tight overseer, but summer is an indulgent master.

With your work always keep ahead, and the grass won't grow behind you. If the work is behind-hand, the grass will be before-hand.

He that works his crop badly will be over-cropped sadly—for to slight work is to increase work.

When overseers become gentlemen, the master must become overseer, or the slave becomes a freeman.

Overseers are often guilty of *oversights*.

He that works of nights sleeps of days—night workers are bad croppers.

If you lose oversight of your overseer, he will lose sight of your business—strict employers make attentive overseers. An overseer neglected is one soon ejected. If the master is much at home, the overseer is but seldom abroad—if one is a man of pleasure, the other will be a man of leisure.

When your overseer puts a black man in his place, he gives a lesson to his employer. If "uncle Tom" is to manage, let uncle Tom have the honor, and his master save the wages.

If you will cure the gall, you will not have the gulley—a gall for want of mending is a gulley in the ending.

Keep your hogs lean or the rogues will be fat. A poor hog is better than no hog. A poor pig in hand is better than a fat pig out of pocket. A mean hog in safety is worth more than a fine one in danger.

A PLAIN OLD FARMER.

From the Essex North Register.

DIRECTIONS FOR WASHING CLOTHES.

In this day of improvements, few have been suggested of more importance, especially to females, than the new mode of washing clothes, which has been introduced into this town [Newburyport] through the agency of two benevolent individuals, now residing at a distance from us. It has been tried by quite a number of females with complete success, and those who have tried it are desirous of communicating it extensively, that others may reap the same benefit which has accrued to them. It is to be used only for white clothes. It does not answer the purpose in case of calicoes and woollens.

1. *Mixture*—Five gallons soft water, add half a gallon of lime water, a pint and a half of soft soap, or a pound of hard soap, and two ounces of carbonate of soda.

2. *Method of washing*—Soak the clothes over night if very dirty, at any rate wet them thoroughly before putting them into the mixture. When the above mixture is at *boiling heat*, put in the clothes that have been soaked or wet, merely rubbing such parts with a little soap that are unusually soiled. Boil them *one hour*. They are then to be taken out and drained, and thoroughly rinsed in warm water, then in the indigo water as usual, and they are fit for drying. The lime water may be prepared and kept on hand—the soda, sub carbonate, (be sure to get the right kind) may be procured cheap, by purchasing it in a large quantity. Let all who feel that washing-day is a day of hard work and weariness, cease to complain, until they are willing to try this safe, easy and expeditious mode of lightening their burdens.

ADVANTAGES OF CULTIVATING CORN BY CROSS PLOUGHING.

To the Editor of the Farmers' Register.

Norfolk County, Nov. 12th, 1835.

As a subscriber to your valuable publication, and one who wishes it great success, I have

thought proper, "it being a privilege," to offer a few remarks on the growth and culture of Indian corn, that may perhaps be novel to some of your readers; I offer as my apology, the pleasure that has often been realized from reading your journal, and gratitude prompts me to attempt some feeble return.

No species of literature affords more useful instruction, than that which leads to the knowledge of extracting from the soil, in the most easy and abundant manner, the best food for man and beast, and which shall leave it in the best situation for similar returns; and no grain more imperiously demands the notice of the agriculturist, than that which is best suited to his various demands, in sustaining health and life, and in suiting itself to the various kinds of stock which are indispensable for his support and comfort. Then may not Indian corn be justly called the "Jaquin and Boaz" of the farmer's support; for there is no crop so well suited to his wants, his interests, or his convenience—none less capricious or uncertain in its returns for labor—none better adapted to the various kinds of soil and climate that surround him—none less choice in its selection of food for support—nor more profitable and fruitful in its returns—but like all other crops, its products may be increased or diminished, according to the mode of cultivation. Though every tiller of the soil in our country is a cultivator of corn, and though it forms the larger part of his crop, still the proper mode of cultivation is so little known, and the little known, is as much disputed, as any other agricultural question that can be named. Is it not much to be lamented, that a grain in every way so well suited to our needs, so easily and surely raised, and so ancient of use, should be so little understood, as to the most suitable way of cultivation? Must we adopt the idea, so long discarded, "that man is not fond of novelty, change, or experiment;" or that agricultural wisdom has been purchased at too dear a price—having either by it, suffered ourselves, or seen others suffer severely, by hastily adopting novel plans of improvement, which had nothing to recommend them but the loud and extravagant praises of the propagators? Often we suffer ourselves to become prejudiced against a change in conducting any concern of life, and obstinately persist in old practices, merely because a trial has been made of them, although constantly witnessing and acknowledging their defects, rather than expose ourselves to the hazard of failure. If we are travelling the old beaten path of our ancestors, or pursuing the same course with our neighbors, we rest satisfied with the result, be it small or great, without, for a moment, making the inquiry whether, by substituting some other mode in lieu of our own, the quantum raised would not be increased, and the labor lessened. Or, should a failure take place, which would be by no means a novelty, it is never attributed to mismanagement in culture, but invariably to the unsuitableness of the season. It is a common saying among Virginia farmers, should their corn crops come in light, "that there was either too much rain, or drought," whilst the fact was notorious, that some of their near neighbors, had a heavy and plentiful harvest.

There are two prominent systems common with us, for the cultivation of corn. The drill system, of which Col. Taylor, late of Caroline, is justly the author; and another system more ancient, that of the cross-ploughing—but in either, the adherents vary in many particulars, but in none, very essentially. The former requires less ploughing and more hand hoeing—whilst the latter requires more ploughing and less hand hoeing; but their dissimilarity is not confined alone to these peculiarities; for the theory upon which their individual modes of cultivation are based, is essentially different. Is it not a palpable absurdity to suppose that both systems can be best under any circumstances? For the one supposes it an injury to the growing plant to cut its roots—whilst the other supposes it a benefit. Both of these systems, founded upon such opposite theories, cannot be correct; for if it be detrimental to the plant at every stage of its growth, to break its roots, then the cross-ploughing system must inevitably be the worst; but if the breaking of roots be no injury, but a benefit, then the drill system cannot be the best. But I am disposed to favor the supposition, that the breaking the roots that fasten on, or near the surface of the soil, is not an injury, but a benefit; for so soon as they are broken, an innumerable quantity of young fibres are thrown out, which fasten in new soil, and consequently, the quantity of sap is increased, because the number of absorbent vessels are increased. Again: the fact is obvious, that the simply running a light iron-tooth harrow over all kinds of small grain, is of infinite service to it—(in the spring season of the year.) Now, how can the fact be accounted for, upon philosophical principles, if the supposition is discarded, that it is not a benefit to break the roots of growing plants? If the appearance of a field of small grain, immediately after the operation, was to be the criterion by which its effects was to be tested, no farmer in his senses could admit it in any way beneficial—for to all appearance, a more rash operation could not be performed. But the fact is clear and undeniable, that it is productive of the happiest effect. I know not how, in any possible manner, to account for the circumstance, if this idea be taken away from me—for if it be an injury to break the roots of corn, or any other grain, it is to me surprising, how the adherents of the cross-ploughing system should make even half crops, or that it does not inevitably ruin any small grain crop, over which an iron-tooth harrow is dragged. The advantages of this, the cross-ploughing system, over the drill, have been strikingly verified in this neighborhood, and fair and ample opportunities have been offered, in testing the comparative superiority of one over the other; for until the last three years, there was not a farmer of any celebrity among us, but who strictly pursued the course recommended by the "justly high famed farmer of Caroline," and verily believed it best; until an industrious and enterprizing Eastern Shore farmer settled among us, on very poor land, and commenced his plan of cultivating Indian corn. The labor-saving system which he rigidly pursued, and the fine appearance of his crop, created at that time, considerable excitement in the neighborhood. Fame having borne the exalted superiority of his crop over that of his neighbors, on land of like character, among the many that went to see for themselves, I, like the queen of Sheba, determined to see in person. It is true the half had been told me—for the novelty of his plan gave no latitude to exaggeration, but I was truly surprised to

see so heavy a crop made by such simple means. He informed me afterwards, that his crop yielded him one hundred barrels—and strange to say, all the cultivation it received, was given it with one plough, without a single hand-hoeing after planting. I asked him afterwards to allow me to become one of his club, by initiating me into the secret, which he did with apparent pleasure; and having for myself tested its labor-saving advantages upon the crop now standing in the field, I will give you the mode, to dispose of, as you please. To many of your subscribers it may not be new—as it is the common course pursued on the Eastern Shore of Virginia, and, for aught I know, many, if not a very large majority, may have practiced it for many years; but should there be one who has never heard of it and would be disposed to profit by the information, then I shall be amply compensated for the task. The system is an extraordinary one—where all the labor is performed by team, and hand-hoeing entirely dispensed with. The field to be cultivated is first fallowed up (during the fall or winter,) in beds forty or fifty feet wide—the wider the better. At planting time it is accurately laid off one way in rows five feet apart, by running a very deep furrow and throwing the slice back again; it is then cross-checked in rows two and a half, three, or four feet wide, proportioned to the strength of the soil—where the checks intersecting each other receive the corn, which is covered with hoes or horses, according to choice or convenience: there is kept up afterwards an alternate succession of cross ploughing, the bar next to, and as near the corn as possible; the field should be gone over twice after this manner, without shifting the position of the plough. The corn is then left standing on a very small square of ground. By this time it is strong enough to bear a gentle earthing with the mould-board. Then the same process is kept up with the mould-board run next the corn, until it shows the first symptoms of tasseling. The ploughs are then laid aside, and the five-tooth cultivator is substituted in lieu thereof—the same system is kept up with them until the shoots and silks fully develope themselves: then all further cultivation ceases, or in other words, the corn is *laid by*. The rotation of ploughing is in such rapid succession, that grass has no opportunity to fix itself on any part of the field; but should it spring so very near the plant, as to be difficult to to remove it in the young stage of the plant, when the mould-board is turned, it is soon covered over and killed; so the process is so very simple that the way-faring man, though a fool, need not err therefrom. If the crop is well laid off, the battle is half won. This year is my first attempt after this manner. A field of two hundred acres was cultivated with six ploughs, exclusive of hand-hoeing after planting, and as far as I can judge of it, standing on the field, to say the least of it, is as good as I ever made: and so far as others have tried it, success has attended the experiment. From the entire success that has attended this mode of cultivation, and the many failures that have attended the drill system, I can but believe that the cross-ploughing system almost under any circumstances, is decidedly best. Though I am partial to the Eastern Shore plan, it is not yet perfect. In the stretch of economy, too much space has been left. The no-hoe system, (as I beg leave to call it,) may be happily adapted to some peculiar kinds of soil—such as are common on the Eastern Shore—a dry sandy soil. But in a country like ours, where such a soil is not common, and grass grows kind and abundant, it would be safer to adopt a medium system—for the crop to receive one hand-hoeing and the ploughs to finish the cultivation: further than one hand-hoeing would be a superfluous waste of labor, except on newly cleared land, where the ploughs could not perform their part with correctness and facility.

With the projected improvement, this system offers many advantages over any other that I am acquainted with—for, at almost all stages of the cultivation, it presents a level surface, which is the best situation that land can be in to derive the full benefit of the rains, which is so essential to a heavy product. This is a consideration too often overlooked by most of our farmers—for soil is only the laberatory in which the food for plants is prepared; nor can manure be taken up by the roots of plants unless water is present. It is the opinion of Sir Humphrey Davy, that water forms by far the greatest part of the sap of plants, and that this substance, or its elements, enters largely into the constitution of their organs and solid productions. A level surface then, permits the rains to exert an equal influence on all parts of the land alike. Unlike the ridge or drill system, when the rains fall on the ridges it does not penetrate, but runs directly off into the water furrows, from whence it is conveyed to the ditches, without being permitted to benefit the growing crop to its extent: so that system of cultivation which affords the greatest facilities to the perfect action of the vital support of all plants, must be best. But the objector may insist that a level surface leaves the plant too much exposed to the blighting influence of a superabundance of water. "Such a crop season would rather be a novelty—for drought has been the most prominent characteristic of our summers." But should the order of things change, and our seasons become wet, still I am of the opinion that a level surface would possess the most advantages—(I well know the ground which I occupy to be disputed, and I would not presume an opinion if observation had not first given it) for if the surface be level, the water will pass off through its natural sources to the ditches or drains—for by one of the immutable laws of that unstable element, it must find its level, and no barrier is insurmountable in obeying that law; by it, avenues or ravines have been forced, through which it communicates itself until it finds in first station, the ocean. So upon the level surface system, the superabundant water passes off the same way that it did before the land was in cultivation, assisted by ditches, to hasten its passage. But upon the ridge system, these natural ravines or conductors are obstructed by the ridges crossing them: so the water is not permitted to pass off its own way, without breaking through, and washing away these newly formed barriers. It then necessarily must stand in the water-furrow, and exert its worst influence on the growing crop. There are many more advantages that this system offers—that of seeding small grain—also, to derive the full benefits of the sun's rays, to warm the earth alike. But whether it possesses an advantage over the drill cultivation or not, as it regards the best or worst position of the surface during culti-

vation or after, one fact is certain, that there is involved in it one of the most prominent features of agricultural reform—that of saving labor—and can command the best argument in its behalf—that of unrivalled success. When labor can be saved, and success is certain, with the prudent husbandman it will weigh more than all the speculative deductions, and plausible theories, that the most learned or scientific can offer. For there is no experimental farmer among us but what has tested the truth of Johnson's remark, that in agricultural matters, practice is contradicting theory every day. My remarks, are with you, to dispose of as you please. They have but one merit—that, "facts are stated."

A. S. F.

DESCRIPTION OF CERTAIN REMARKABLE PRAIRIE AND WOODLAND SOILS OF ALABAMA.

To the Editor of the Farmers' Register.

Erie, Greene Co., Ala.
September 7th, 1835.

The October No. of the Farmers' Register, containing your dissertation upon the prairies, and the analyses of the soils, came duly to hand. I am very much surprized that the specimens from Noscubee county contained no carbonate of lime. It not only militates against your theory of the formation of prairies, but also against our pre-conceived opinion that the rust is caused by an excess of lime in the soil. I had for some time, however, abandoned that opinion from observing that where the prairie joins, or runs into, the sandy soil, the cotton rusts more than in the open prairie—particularly where there is no clay near the surface. I have had some specimens of our prairie soils some time for you, but have not had time to put them up and send them.

No. 1 is of the kind of soil I have just been speaking—a loose dark friable sandy loam; whether calcareous or not, I cannot say, as it is very much like No. 12 of the specimens reported in the October No. of the Farmers' Register.*

No. 2 is from our open or bald prairie, which has been cultivated seven or eight years—taken from near the same place; produces corn very well—nearly fifty bushels to the acre are now standing on the ground; but cotton does not produce so well on it as on poor sandy soil. I feel very confident that this specimen is highly calcareous, as there are many fragments of shells mixed with the soil, and the rock is not two feet from the surface. Of all the specimens hitherto sent, this is the one which will give the nearest approach to the general character of our open prairie land in this part of the country.†

No 3 is from the post oak land immediately adjoining the prairies. It is a very tenacious, argillaceous soil; produces cotton well, but is difficult to cultivate from its tenacious character, which causes it to retain its moisture in excess; hence it is very muddy in rainy seasons, and very hard in wet. There are some considerable bodies of this kind of soil interspersed among the prairies, but generally, it is very poor, and produces very badly. Cotton succeeds better on it than corn, and it is too wet in winter for small grain. The color is from a white livery to a chocolate. In some of it, there is scarcely any sand apparently, and the roads through it in winter become impassable for loaded carriages.*

The next specimen, No. 4,† is from Madison county, in this state, about half way between Whitesburg and Huntsville. It is a fair specimen of their best soils—was taken from near the surface of land which has been cultivated for many years. It originally produced corn and cotton very well; but that part of the state can no longer vie with the south in raising the latter article, even where the lands are fertile. The knobs and spurs of the Cumberland mountain are interspersed very generally over Madison county—and this specimen was taken not far from a mountain of blue limestone rock; yet, judging from the result of your other investigations into the nature of similar soils, I should doubt whether you would find calcareous matter in any excess. Most of the blue limestone region of the western country is of a similar soil. After crossing the Tennesee river at Whitesburg, or Ditto's Landing, and proceeding five miles south, you ascend the main Cumberland mountain, which is about a mile and a half, as the road runs, to the top. Before you reach the top, however, the rock changes from a blue limestone to sandstone, and continues of this description till you get into Jones' Valley, near Elyton, where the limestone is again seen in parallel laminæ, extending north and south, and varying from about 45 to 80° of elevation. The last traces of the blue limestone are about sixteen miles east from Tuscaloosa, where they burn a good deal of rock lime for the country below. All this country from near Tennessee river to the city of Tuscaloosa, is full of excellent pit coal—the inhabitants digging it up out of the beds of creeks, &c. for their forges, and for fuel—when they use it at all. The face of the country is generally broken and poor, until you get to the rotten limestone region, about forty miles south of Tuscaloosa, from whence I send you the first three specimens.

ROBERT W. WITHERS.

*This specimen, upon examination, was found to contain 8 per cent. of carbonate of lime. Ed.

†No 2 contained 33 per cent. of carbonate of lime. This, as a specimen of the most general quality of prairie soil, (as Dr. Withers thinks,) deserves particular notice.

From the American Gardener's Magazine.

ON THE CULTIVATION OF HYACINTHS IN GLASSES AND POTS.

The following observations, though not written expressly for this Magazine, we have thought might be of considerable interest to many of our readers who cultivate hyacinths and other bulbs. The season is now approaching for planting them and many may be induced to grow a few, who have heretofore been prevented, from the want of information on the subject. Hyacinths in glasses,

*No. 3 contained no carbonate of lime.

†No 4—also none. Ed. Farm. Reg.

it cannot be supposed will flower as well as when in pots; but they have a very beautiful appearance, and flower sufficiently strong to render them highly desirable.

For this purpose, the earliest kinds should be selected; and we would state, that we prefer single to double ones, or at least, an equal number of each, for the following reasons: the spikes are much taller, the bells far more numerous, the colors more vivid, and the fragrance very powerful; indeed, in some of the best kinds, the bells are so profuse as to form a complete pyramid of flowers. If attention is given to the following simple observations, no fear need be entertained of disappointment.

Select good large solid bulbs, especially for glasses; we have often seen it stated in the communications of experienced growers, that "small bulbs are worse than useless;" it is labor lost, to cultivate those which are sold at *auction;* they are the mere *refuse* of the Dutch florists, such as would be thrown away as worthless; the roots are weak, and would fail to flower well if put in their natural element, the earth; much more so if in an artificial one of water. How frequent we have heard complaints that bulbs start well, make a rapid growth of an inch or two, and then stop; the flower stems dying ere a flower opens. This is from the cause that there is not sap enough stored in the bulb the preceding year; and it must consequently make a premature and sickly growth the following one. Unless attention is paid to the selection of first rate bulbs, disappointment must certainly ensue. All complaints arise from this cause; and if *cheap* bulbs are cultivated, *cheap* looking flowers must also repay amateurs for their care.

Management in glasses.—The bulbs may be put in the glasses any time from October to January; when a succession of flowers is wanted, they may be put in every fortnight. Place in the bulbs, and then fill up with water just so that the bottoms of each will be immersed an eighth of an inch; then put the glasses in a dark cool room until the roots have protruded a half an inch, or so, which is generally in about ten days. They should then be exposed to the sun, light and air, as much as possible. If they receive the sun on one side only, turn them round every two or three days to prevent their growing crooked. Change the water once a week; if the glasses get very dirty, draw out the roots carefully, and give them a thorough washing. The water should not be allowed to freeze. Any *pure* water will do; but rain water is the best.

After bulbs are grown in water, they are not worth saving; as it will take three or four years to recover their strength.

Management in pots.—To bloom hyacinths to perfection, the pots should be seven inches in diameter and ten inches deep; plant only one in each pot; it is almost unnecessary to say, that it is folly to expect to procure fine flowers from a bulb in a pot scarcely large enough to hold a crocus. Put in some broken potshreds in each pot; fill them up with the soil before recommended, and place in the bulb, just covering it; give the pot a gentle knock to settle the soil. Select a dry spot in the garden, and dig a hole eighteen inches deep; place in the pots, and cover them up with the earth six or more inches in depth; upon the approach of frost, cover them with dry leaves, sea-weed or hay. They should all be planted at one period, during the month of November.

Two or more pots can be taken up at any time throughout the winter, thus giving a succession of flowers from January until April. If there is no garden to place the pots in, they should be put in a box in a cool cellar, and covered with earth in the same manner. This is the method we have practised, and have never failed in blooming them well. We have had the main stems of some single ones eighteen inches high, with upwards of *fifty bells*, forming a pyramid of flowers more than twelve inches in height. It cannot be supposed that a bulb, set in a pot and immediately forced into growth, will flower strong; they must acquire roots first to support the foliage.

When they are in flower, give them plenty of water, by placing pans under the pots, and keeping them constantly filled. We have seen manure water recommended, but we have never, ourselves, tried the experiment; cease to give water when out of flower, and discontinue it altogether when the leaves assume a decaying appearance.

Roots that have flowered in pots are but little injured, and will bloom tolerably strong the next season, if set out in the ground; the same bulb should never be set in a pot two successive years, but by shifting them alternately, from the pot to the garden, they may be made to flower vigorously.

The management of the hyacinth in beds, to flower them to perfection, will be given in some future number.

As many of our readers may not know what constitutes the properties of a fine hyacinth, we extract the following from Maddock's Florist's Directory:

"The stem should be strong, tall, and erect, supporting numerous large bells, each suspended by a short and strong peduncle or footstalk, in a horizontal position, so that the whole may have a compact, pyramidal form, with the crown or uppermost flower perfectly erect. The flowers should be large and perfectly double; that is, well filled with broad, bold petals, appearing to the eye rather convex than flat or hollow: they should occupy about one-half the length of the stem. The colors should be clear and bright, whether plain, red, white or blue, or variously intermixed and diversified in the eye: the latter, it must be confessed, gives additional lustre and elegance to this beautiful flower. Strong, bright colors are, in general, preferred to such as are pale."

The following is a list of superior kinds, and may serve to assist some in making their selections:

Double white.

General Washington.
Prince of Waterloo.
Triumph Blandina.
La Deese.
Miss Kitty, *rosy eye.*
A la Mode, *rosy eye.*

Single white.

Grand Blanch Imperial.
Grand Vainquier.

La Candeur.
Duc de Cumberland.

Double yellow.

Bouquet d'Orange.
Duc de Berri d'Or.
Ophir.
Louis d'Or.

Single yellow.

Princess Charlotte.
Crœsus.

Double red.

Bouquet tendre.
Groot Voorst.
Marquis de la Coste.
Comte de la Coste.

Single red.

Cochineal, *crimson.*
La Balaine, *rosy.*
Lord Wellington, *rosy.*
L'Eclair.
Mars, *crimson.*

Double blue.

Grand Vedette, *pale.*
Martinet.
Habit Brilliant.
Comte de St. Priest, *pale.*

Single blue.

La Crepuscule.
Grand Vedette.
L'Ami de Cœur.

From the Genesee Farmer.

TRANSPLANTING FRUIT TREES.

This is commonly considered as one of the most difficult operations in the culture of fruit trees; but if properly performed is very rarely attended with any difficulty or risk. It is a very common opinion that a transplanted tree must of necessity continue nearly stationary in its growth for a year or two after the operation, or at best make but comparatively little progress. A tree, however, *properly* transplanted, will experience very little check in its growth, and often apparently none. Hence the very great importance of the operation being well understood. Much has been written in explanation of the theory of successful transplanting; but we merely intend here to give a brief description of the practice which experience has proved to be uniformly attended with success, and the most obvious principles on which it is founded.

There are two great points to be observed in removing trees from the soil; first, to preserve the spongioles uninjured; and secondly, to prevent evaporation, by which the tree becomes dry, and if carried to excess, beyond recovery.

1. *Preservation of the spongioles.* These are the minute spongy extremities of the smallest fibrous or branching thread-like roots, through which, as mouths, the tree receives fluids and other nourishment from the soil, and not through the surface and sides of the roots as is sometimes supposed. As these spongioles are exceedingly delicate in their organization, a very slight degree of violence injures or destroys them. The more carefully therefore trees are removed from the soil, and the more entire the fibrous roots, the greater will be the number of uninjured spongioles remaining, and better will the tree be supplied with nourishment after it is planted again in the soil. And hence the absurdity of the practice, which has been recommended by some writers, of cutting off most of the small fibrous roots because they cannot be easily replaced in their natural position in the soil.

2. *In order to prevent evaporation,* the roots should never be suffered to become dry, but as soon as removed from the ground, they should be enveloped in some damp substance; wetted straw serves well for a temporary protection. But when intended to be conveyed to a distance, and there is a probability of their being several days out of the ground, damp moss should be employed in packing about the roots, as straw is liable to ferment if kept long in a wet state. Previously to packing them in the moss, it is an excellent practice to immerse the roots in soft mud or a mixture of the soil and water, so as to coat their surfaces, after which dust or dry sand is to be sprinkled copiously over them to complete the coating.

The *holes* for receiving the trees should be dug large—not less than five or six feet in diameter at the very least, and eighteen inches deep. The hard and steril subsoil should be thrown out, and its place supplied with rich mould or muck. Where the holes are dug in ground in grass, the turf which is removed from the surface may be inverted in the bottoms. If manure is placed in them, it should be well rotted, and should never be allowed to come in contact with the roots, but should be placed in the bottom, at the surface, and in the more remote parts. The tree should in general be set a little deeper than it originally stood, but not more than two inches; the roots should be spread out horizontally in all directions, so as firmly to brace the trees when they become large; moderately moist and finely pulverized earth should then be gently shaken in about them, so as not to disturb the position of the fibres, until the hole is filled. Care should be taken that all the interstices among the roots be perfectly filled, so as not to leave the smallest cavities; and throwing in the earth in large quantities should for this reason be especially avoided. In order that the soil may be gently packed on every side of all the roots, it is very useful when the soil is inclining to dryness, to pour in a quantity of water as soon as the roots are covered, and then the remainder of the earth shoveled in, which latter prevents the surface from becoming hard by baking. After the operation is finished, a stake should be set in the ground leaning towards the tree, to which it should be tied with a band of matting or of straw, to brace it firmly in an upright position.

Placing the tree leaning a little towards the south or southwest, or with the most projecting branches in that direction, will prevent the trunk being injured by the action of the rays of the sun in hot summer afternoons, an evil which is sometimes so serious as to cause the death of the tree.

Autumn is ordinarily the best time for removing

trees—more time is then afforded than in the hurrying season of spring—besides which the earth becomes more settled about the roots, and new spongioles are produced in place of those which may have been destroyed, especially if the operation is not performed too late in autumn. Better trees also may be obtained in autumn than in spring after nurseries have been culled. But if tender kinds be transplanted in the fall, and particularly if they be removed to a colder section of the country, they will, from their mutilated state, be more liable to injury from frost. To those therefore, who live remote, and are unable to obtain such trees for early planting in spring, or those who live in the colder regions of the country, we would recommend to procure their trees in autumn, and bury the roots and a part of the stem and branches in a trench dug for the purpose, the roots being packed closely together, and the branches resting in an inclined position upon the earth; which operation is technically termed by nurserymen, *laying in by the heel.* In this way they may be effectually protected from injury from the frosts of winter.

Nothing is more common than to loose trees by transplanting; but there is no necessity for such failure;—if trees are transplanted with proper care, there will be an almost absolute certainty of their living. If when they are taken from the earth, care is taken to remove the roots entire—to keep them fresh—and in replacing them in the soil, to pack finely pulverized earth well about the roots, preserving them in their natural position, there can be little danger of success.

But it is not only necessary the trees should *live*, but that they should *thrive* also; and for this object, it is indispensably requisite that they should have a large deep bed of loose soil for the roots to penetrate. If the ground is of a hard or heavy nature, the holes must be made large and deep and filled with the proper materials, for if the roots are confined in small holes dug in such ground, they will succeed little better than if planted in a small box of earth.

DESCRIPTION OF "CAMEL" LIGHTERS, FOR CARRYING MARL.

[The excellency of the plan of the vessels described below, will strike every one who has had experience of the difficulties attending those of the ordinary construction—and we doubt not that, by their introduction, our correspondent will serve the public interest as well as his own. In loading and unloading the ordinary decked lighters, there is great loss of labor; and open lighters loaded with marl, are in great danger from storms. Both these great objections seem to be obviated by this plan, besides attaining some less advantages.]

To the Editor of the Farmers' Register.

November, 1835.

I have just been reading the last number of your useful journal. The first article that met my eye was *editorial*, and headed "facts wanting." This at least shows candor. Such complaints generally proceed from the opposite quarter. Well, then, in the words of a noted bibliopolist, when puffing a favorite article, "the absolute fact is" that I do not know I can at this time, or perhaps at any other time, do a more acceptable service to the agricultural interest, in eastern Virginia, than by describing and recommending a sort of lighter I have been lately building for the transportation of marl. It is significantly called a "camel," from its receiving the load on the back—in other words, the deck. Its recommendations are its simplicity and cheapness, buoyancy, and consequent security against storms, and the facility with which the load may be discharged. These advantages will, I think, be palpable, from a mere description. I here take pleasure in acknowledging the obligation I am under to an observant friend, for suggesting the plan—and indeed for the personal superintendence and instruction, which enabled me to overcome the prejudices of a ship carpenter, whom I had employed on the occasion. This individual had no idea of a decked lighter, without knees, carlines, keelsons and other things, hard to call, and still harder to get, and to work when got. By mingled entreaty and command, he was induced to build a camel; and now no one is more clearly impressed with their utility. To show my opinion of their superiority, I will state that I have three completed. I had previously commenced an open one, now on the stocks, which I shall be pleased to dispose of to any of your subscribers in want of such a vessel. The materials are excellent. It can be finished on short notice, and delivered where wanted—though I will be honest enough to say I do not recommend it, except for live stock, wood, and very bulky commodities. But I must stop. I sat down to compose an article for the benefit of others, and lo! I am penning an advertisement to benefit myself. Oh self-interest! what an insidious thing thou art. I do not ascribe to the friend, who communicated the idea of the camels, any merit on the score of invention; and I presume it would be no easy matter to say to whom that is due: for aught I know, to some ancient Egyptian, who hit on the expedient for removing the immense blocks that compose the pyramids. I hope, by the way, for the support of this *ingenious* and *important* supposition, that the aforesaid pyramids are situated near the canals which intersect that celebrated region. The gentleman referred to, happened to be at Old Point a year or two since, at that season when folks do congregate there for health and pleasure, and observed these lighters engaged in the transportation of stone, sand, &c. Some were undergoing repair, which gave a good opportunity of examining their construction. "*Hinc illæ*"—not tears, Mr. Editor, but camel lighters. I cannot give a better illustration of these lighters than by likening them to a *huge*, *flat*, *oblong* box, bevelled at each end nearly, but not quite, to the top; and consisting of four longitudinal and parallel planks, viz: the sides and two others intermediate and equi-distant from them and from each other, dividing the box into three long and equal compartments; across and upon which four planks are nailed at the bottom and top. My lighters are 40 feet long at top, and 35 at bottom, 12 feet wide, and about 30 inches deep, including the thickness of the bottom and top planks. These planks are two inches thick, as are the longitudinal ones in the middle. The side planks are three inches, and must, together with the parallel middle ones, in all cases be got the full length of the lighter, for the sake of

strength. It would be desirable to have the side pieces of sufficient width to dispense with a seam; but that can rarely be done, and never without great waste of timber, as nothing but heart should be used. It will therefore be advisable to hew the long stocks for this purpose, with two opposite sides, inclined or sloping, with a reduction, graduated by the diminished size of the heart towards the smaller end, so as to preserve the heart, and reject the sap. Two of these planks will form a side, with an oblique seam, by putting a wide and a narrow end together. For want of this simple suggestion, while getting my timber, of which I merely gave my *head* carpenter a bill, I have been compelled to use four long, narrow planks on a side, in one (though only one) of my lighters, with what waste of labor, timber, and caulking, may well be imagined. These side planks, whether two or more, must be fastened together by seven bolts on each side, three-quarters of an inch in diameter, extending from top to bottom, and screwed up so as to make them as compact as possible. Between these bolts, batons one and a half inches thick are nailed on the inside between the bolts. The middle planks, parallel to the sides, may be secured by batons alone, with bridges (as I believe the carpenters call them) introduced in two different places. In cutting timber for the top and bottom planks, it will be some economy to get the stocks of such length as may be divided by the width of the lighter without a remainder—as in mine, 12, 24, or 36 feet. If any sap must be used, it should be at the bottom. In every other situation it should be peremptorily rejected. The spikes for the bottom and top should be wrought, five and three-quarter inches long; those for batons, &c. four and three-quarters. I have mentioned that my lighters are 40 feet long at top and 35 at bottom—each end being bevelled two and a half feet, to within six inches of the top, where an oak piece, four inches square, is let in, across each end of the lighter; the longitudinal middle planks being cut away to receive them. The sides are fastened to the oak pieces by a small horizontal iron knee, one foot each way, secured by four bolts. At the turn of the bottom, where the slope commences, oak timbers, cut of the proper form, two feet long and three inches square, are nailed to the side and middle planks; other pieces are then lapped on them, and extend along the slope up to the transverse oak piece occupying each extreme end. This is done to strengthen the ends of the lighter, the planks on which are doubly spiked, to enable them to bear the violent shocks they will receive on approaching and striking the shore. Having taken these precautions, the bottom, top, and sloping ends, are covered with well jointed plank, nailed cross-wise, and as closely together as possible; the whole is snugly caulked and coated over heavily with pitch. A pump about five feet long, is put in one corner for future occasions, in case a leak should spring; and the lighter, water proof top and bottom, is launched upon its future home. I should remark that four oak standards, two and a half feet long, and three by five inches square, should be ranged along on each side, secured in their places by staples with threads at the ends, and taps—the standards next the ends to serve as rullocks by means of a pin near the top, and the whole to serve for loose planks to rest obliquely against, to prevent any thing from rolling overboard. The oars for such lighters may be 22 feet; the rudder may be a crooked oar in fact, with a hole, to receive a bolt fastened in the stern of the lighter. The lighter above described, it will be perceived, is as tight as a corked bottle, and will so remain as long as it is kept in good order, for which purpose it should from time to time be covered with pitch. It cannot be sunk, though the cargo may be washed overboard; a great advantage, as in my exposed situation, *that* has sooner or later been the fate of all the open lighters I ever owned. It is hardly worth while to observe that suitable apertures should be made in the lower part of the two long partition planks to permit the water, should any ever enter the lighter, to flow from the other compartments into that in which the pump is situated. My lighters were built on blocks raised high enough to allow the workmen to operate beneath. They are calculated to resist high winds: in protected situations, and particularly in narrow and shallow streams, thinner plank than that which I have used, would perhaps answer better; but in regard to that, each one must judge for himself. I have received large quantities of oyster shells, from the vessels, in my lighters, so as to test their utility. I have been too busy since their completion to commence getting marl, but shall in a few days set about that interesting operation; and when well under way, you may perhaps hear from me again to the tune of "the Campbell's (camels) are coming."

H.

For the Farmers' Register.

PROCEEDINGS OF THE BUCKINGHAM AGRICULTURAL SOCIETY.

At the first annual meeting of the Buckingham Agricultural Society, held at Mr. Robert Shaw's on the 15th of October, 1835, the president, Col. Thomas M. Bondurant took his seat, and called the meeting to order. After which, he proceeded to deliver the Annual Address, requested by a resolution of the society. At the close of the address, the following resolution was adopted, viz:—

Resolved, That the president be requested to furnish a copy of his address for publication in the Farmers' Register—and also, that five hundred copies of the same be published for the use of the members.

Maj. Charles Yancey was elected president; Price Perkins, William Woodson and Beverly A. Brown, Esqs. as vice-presidents for the ensuing year.

The committees appointed to award premiums made their reports, which were adopted, viz:—

Hogs. The first premium to Col. C. M. Bondurant's boar Surry. The second premium to Col. T. M. Bondurant's sow Blue Rose. The third premium to Capt. Wm. N. Patteson's boar Buckingham.

Cattle. For the best bull over two years old; the premium to Col. T. M. Bondurant's Durham and Hereford bull Frederick.

For the best bull under two years old—the premium to Capt. Richard G. Morris's North Devon bull Thompson.

For the best cow over three years old—the premium to Richard G. Morris's North Devon cow Odell.

For the best heifer under three years old—the premium to Dr. William P. Moseley's Durham and Hereford heifer Snow Ball.

For the best fatted ox or cow—the first premium to Col. T. M. Bondurant's Red Cow. The second premium to Mr. Price Perkin's Red Ox.

For the best yoke of work oxen—the premium to Robert Shaw, Esq.

Sheep. For the best ram—the premium to Dr. Wm. P. Moseley.

For the pen of six best ewes—the premium to Col. T. M. Bondurant.

Domestic fabrics. For the best suit of clothes—the premium to Col. Jesse Holeman.

For the best piece of negro winter clothing—the premium to Col. T. M. Bondurant.

For the best piece of carpetting—the premium to Col. T. M. Bondurant.

For the best specimen—the premium to Capt. Wm. N. Patteson.

Horses. For the best thorough-bred filly under two years old—the premium to Maj. James M. Patteson's Empress by Tonson, dam by Archer.

For the best brood mare, other than thorough-bred—the premium to Maj. Granderson Moseley's Woodlark, by Powhatan, dam by Cultivator.

For the best colt or filly, other than thorough-bred—the premium to Dr. Wm. P. Moseley's bay filly, by Moderator, dam by Bolivar.

For the best mule raised in the county, under five years old—the premium to Maj. Granderson Moseley.

Resolved, That Col. Thomas M. Bondurant, Dr. Wm. C. Moseley, Maj. Charles Yancey, Maj. James M. Patteson and Col. Beverly A. Brown be appointed to attend a proposed Agricultural Convention in Richmond, sometime the ensuing winter.

Resolved, That the next annual meeting be held at Mr. Robert Shaw's.

Resolved, That the president elect be requested to deliver an address upon the object and utility of agricultural societies.

Resolved, That the foregoing be sent to the Farmers' Register for publication.

Resolved, That this meeting do now adjourn.

THOMAS M. BONDURANT, PREST.

G. N. MOSELEY, R. S.

Address of Col. Thomas M. Bondurant, President of the Buckingham Agricultural Society, delivered at its annual meeting, on the 15th Oct. 1835.

GENTLEMEN:—At your last meeting a resolution was adopted, requesting your president to deliver an address on the "objects and utility of agricultural societies." When I look over this intelligent assembly, I perceive that it is composed of those, who are much better qualified than I am to discarge this duty—those who are able to impart information to me, instead of receiving interest or instruction from any thing that I can say.

This is the first annual meeting of the Buckingham Agricultural Society, and my most ardent wish is, that each succeeding anniversary may be hailed with a deeper interest and a livelier zeal in the cause of agricultural improvement. Could I flatter myself, that my powers of mind were adequate to grasp and exhibit in a proper point of view this great subject, and to impart to it those attractive charms to which it is entitled, I should enter upon the task assigned me with greater confidence, and might be encouraged to hope to draw some new votaries to its shrine. But I am conscious, that, from my limited abilities, I am unable to present this subject in as imposing an attitude as its importance demands. And when I take a survey of the wide and extensive field before me, I am almost tempted to shrink from the undertaking; but, as it has been my course through life never to shun any duty that might be required of me, I shall, in a plain and brief, though I fear, an unconnected and uninteresting manner, attempt to perform the one which you have imposed upon me. In the performance of this duty, I throw myself upon your kindness and indulgence, trusting that my zeal in a good cause may compensate, in some degree, for my many imperfections.

In speaking of the objects and utility of agricultural societies, called for by your resolution, I suppose, I may be permitted, as there is a close connection between them, to speak of the prevailing defects in agriculture, and to point out what I may consider the remedy. This branch of the subject is of the first magnitude, whether taken in a physical, moral, political or national point of view. To know the defects in the present systems, and to ascertain the remedies constitute the main ends for which our association was organized.

I will proceed in the first instance to speak of the advantages resulting from the formation of agricultural societies, their objects and utility; next the importance of the agricultural profession, compared with other professions; and then point out some of the material defects in the systems of agriculture, and recommend a remedy.

With regard to the objects and utility of agricultural societies, it may be observed, that they have a tendency to excite greater interest in improvement; to bring together the agriculturists of the country, thus enabling them to compare their views, so that the information possessed by one, may become common to all. It is the formation of a joint stock company, the dividends of which, are to be drawn in the shape of increased knowledge on the great and interesting subject of agriculture. By your constitution, an annual contribution is to be made to the fund of practical information. From that valuable clause in our constitution, requiring from each member an essay on some subject, connected with agriculture, I expect to receive much benefit, and that the public will be laid under heavy obligations. Let this requisition be strictly complied with, and much good will result, not only to the members, but to their neighbors and to the county. It is a notorious fact, that when one person begins to improve in any neighborhood, others speedily see its advantages, and are excited to follow his example. In those different essays required of your members, we shall not only have theory, but practice. Thus each one pays his instalments into the common stock, and meet together and draw their dividends in a compound ratio as one to the whole number: this cannot but be profitable stock. The dividends which we shall draw, will be more than equal to the requisitions made upon us; then this ought to be a sufficient inducement to make us all punctual in paying up our annual instalments. In a multi-

plicity of counsellors there is wisdom. The wisest and most profitable agriculturist amongst us, will receive a large dividend in the increase of his stock of information. No individual possesses as much information as is diffused through the whole number of members; here, then, are some of the benefits resulting from the formation of agricultural societies. But these are only a part of the advantages connected with agricultural associations. I might specify many others: the cattle show, connected with them, will certainly have the effect of creating a spirit of improvement in the breeds of cattle. Of all animals, the cow is perhaps the most valuable, whether considered in reference to the milk, butter and beef with which our tables are supplied, or in reference to the valuable labor performed by the ox upon the farm, or in carrying its produce to market. And after he has performed his full quota of service on the farm, when put into the stall, he is even then more valuable than ever.

This, then, is another important advantage of agricultural societies. I might continue to speak of improvements in all the domestic animals that are useful to man, the horse, sheep, hogs, &c.; the improvement in which, is intimately connected with the objects of agricultural societies.

But I will pass on to notice, in the next place, the importance of the agricultural profession, compared with other professions.

Gentlemen: the subject to which I am about to call your attention, is of momentous interest. The agricultural profession is of more importance than all others. It is the profession from which all others receive their life and support. It is like the main spring in a watch, which puts the rest of the machinery in motion—it is like the main artery in the human system, which pervades and gives life to the whole animal constitution: it may be compared to the spinal marrow, which, if broken, causes the decay of the whole system. The lawyer, the physician, the merchant, the mechanic, and divine, all receive support from this profession.

Behold! the seas covered with shipping, and their sails spread to every gale—all set in motion—all supported by the agricultural profession. Then can we not, ought we not, to feel a deep interest in elevating this profession to its proper rank? Can there be one spark of patriotism burning in the breast of that man, who would be unwilling to contribute his humble mite to the advancement of this great and important interest? Cold and selfish must be the heart of that man, destitute of a single glow of patriotic fire, who would be unwilling to step forward and contribute to the elevation of this important profession.

As Swift says, "and he gave it for his opinion, that whoever could make two ears of corn, or two blades of grass, to grow on a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together."

Gentlemen, this great and important interest has been kept in the back ground too long. It has been a hewer of wood, and a drawer of water to other professions long enough. It is time that it should shine forth in all its beauty and strength, and be elevated to its proper stand in society. The main spring should not be considered inferior to the other parts of machinery to which it gives motion. Destroy and break down the agricultural profession, and all other professions will languish and die. That there is a great evil prevailing, and which calls loudly for a remedy, must be apparent to every reflecting mind. Why is it, that there is so little interest felt for improvement in agriculture? Is the field not wide enough? Is there not room enough to give full scope to talents and genius? Is it unworthy of talents of the first order? Surely in this field—on this great and important subject, all the talent and genius, all the noblest faculties of man, might be brought into lively exercise, and have full scope to be useful to themselves and to mankind—in considering the plants of the field, studying the properties and qualities of soils, the best mode of improving and applying manures, and in imparting their information to others and exciting a greater interest in improvement. Such an employment cannot be unworthy of any man.

Gentlemen—that there is something wrong must be apparent to every intelligent mind—that there is a fatal disease prevailing cannot be doubted, and unless the remedy is speedily applied, will sap the foundation of this republic—the liberties that we now enjoy, for which our forefathers fought and bled, will be of short duration. Let us inquire into the nature and cause of the disease, and what is the remedy. A skilful physician, when called to visit a patient, first endeavors to find out the nature and cause of disease—being satisfied upon this subject, unless the disease is incurable, the remedy is easily applied. The principal disease in the agricultural profession, is defect in education. Heretofore, it has been considered altogether unnecessary to educate sons, whose occupation was to be that of tilling the soil. If they could multiply two by two, take one from three, and write their names, this was all that was necessary. Of late, some little more interest has been felt on the subject of education, but still there is great deficiency. The agricultural community must be enlightened, must be educated, to enable them duly to appreciate liberty, and the blessings that flow from our happy form of government. I would say, educate your sons for the farm, instead of making professional men of them. In the common acceptation of the word, *professional* is intended only to apply to law and medicine, in which sense I use it. But agriculture is as much a profession as any other calling: in this sphere they can be useful to themselves and to society.

The professions of law and medicine in this country are already overgrown. Many who fill them are mere drones, hangers-on upon society, without any, or but little, business; and of course the temptations to idleness, vice and their consequences, are of fearful character. No greater evil can befal any community than to have those professions overdone. It has been the prevailing practice in Virginia, if a man had a son that he considered a tolerably smart fellow—and most parents are inclined to give their children more credit for cleverness than they are entitled to—why, he is such a prodigy that he must be a lawyer or doctor! Most mistaken and ruinous notion! Educate those smart sons of yours for the farm; they can be clever fellows here, as well as in the practice of law or medicine; they can be as useful in

this sphere as the other. By pursuing this course, you will elevate the agricultural interest. It may be thought by some, that I am opposed to other professions, that I am disposed to detract from, and to disparage them. Not so; they are valuable and useful to society. But all cannot live by the professions of law and medicine, and the thirst for those professions ought to be checked. I again repeat, I have no intension to detract from those professions; my only wish is, to exalt the agricultural profession.

Gentlemen—the seat of the disease lies in defect of education; let us attack it at its root; the remedy must be applied. Love of country, love of morality, love of our blessed institutions, all demand it of us. Then let us be up and a doing; we have rested on our oars long enough. Educate your sons as farmers—agriculture is as much a science as any of the other professions. Is it possible that any man can be acquainted with the different qualities and properties of soils; tell the constituents of which they are formed, unless he be an educated man? Can he be a judge of the most advantageous mode of applying manures—tell what kind of manure is best adapted to the improvement of different soils? Certainly not. The soil is as variable as the faces of men, and requires different modes of cultivation. I again repeat, that it is all important that agriculturists should be educated, and in this way the profession will be exalted. Knowledge is power—and if the farmers of the country were educated, the profession would take that stand in society, to which its importance justly entitles it.

The remark was used by the illustrious Jefferson in the trying times of 1798 and 1799, in a letter, if I mistake not, to Wilson C. Nicholas, that the only thing to save the country, and bring the government back to its original simplicity; to the spirit and letter of the constitution, was to fill the offices of the country from the agricultural interest, to lay aside those who were politicians by trade. It is all important that agriculturists should be enlightened, educated men; it is the only way by which the liberties that we now enjoy can be perpetuated. Let your farms be cultivated by educated men, and the blessed institutions in which we now rejoice, will remain as long as time endures. It is important that the agriculturists of the country should be educated, that they may be able to scan with a jealous eye the actings and doings of their leaders, their politicians in high places—calling no man master, suffering none to think for them, but in every case, being qualified to form opinions and act for themselves. Let this be done, and all will be well. Your sentinels may stand on the watch tower until generation after generation shall have passed away, and still continue to re-echo "*All's well! All's well!*"

Why should the great and important agricultural interest be held secondary to other professions? It is easily answered—it is in the defect and want of education.

It is certainly true, that if you educate and thereby elevate the agriculturist, there will be less use for some of the other professions; less use for physicians and lawyers. This would certainly be a benefit to the public, and in this way, and this way only, would I wish to affect those professions. If I possessed talents equal to any man that lives, or has lived, I would be willing to exert them all in endeavoring to arouse my countrymen from their slumbers, to a spirit of education and improvement in agriculture. Let the minds of the agriculturists be improved, and improvement in agriculture will as necessarily follow as that an effect will follow its legitimate and efficient cause. It is a lamentable fact, that the improvement in agriculture is advancing with but slow progress. Improvements are rapidly being made in the mechanical arts and sciences, whilst it appears that the agricultural interest is fast asleep. In passing along the highways through the Old Dominion, the land of Washington, Jefferson, Madison, and a host of other sages; the gullied hills and piney old fields become visible to the eye in every direction; the bad management of the fathers, compelling their sons to fly from the land of their birth, which promises nothing but poverty and want, to the far west in pursuit of fortune and fame.

The spirit of emigration is now raging to a fearful extent. Many of Virginia's most talented and enterprising sons are losing their attachment to the homes of their fathers, to the spot that contains the ashes of their friends, flying to other lands in pursuit of a more fertile soil. Unless a greater spirit in improvement can be excited in the minds of our countrymen, Virginia, proud Virginia! the mother of us all, the name which of itself gives passport, and in every clime, commands respect, will continue to decline and lose her political weight as a member of the confederacy.

I am well aware that the views I have taken in favor of agricultural education come directly in contact with the prejudices of a large number of persons. There is a prejudice prevailing against what is called book farming, book knowledge. This is a mistaken notion and shows to what extent man can be carried by prejudice: and in connexion with this I will relate an anecdote—a farmer of our county, a worthy citizen, remarked not long since, "there were some things he disliked more than all others, to wit: *The Farmers' Register* and blind ditching."

Is not most of our knowledge derived from books? Agriculture is as much indebted to the arts and sciences, as any other profession. Deprive the agriculturist of the benefits derived from these sources, and your common implements of husbandry will be taken from you.

It has been frequently argued, that it was unnecessary to educate the agricultural profession, and often particular persons who are uneducated, and who have been successful in agricultural pursuits, are pointed out to prove the proposition. Can any thing be more fallacious? Is this conclusive testimony, or rather does it prove any thing? It only proves that such men are gifted by nature with strong and powerful minds, enabling them to rise superior to the disadvantages under which they labor, and does not prove that their success would not have been still more signal. I have no doubt, that all such feel, and sensibly feel, that they labor under difficulties which education would have removed.

Improve the mind;—this is first in importance, and the improvement of the soil, and improvement in all the various branches of agriculture, will follow as a necessary consequence. I have already probably consumed too much time on this branch of the question. I will pass on to the consideration of the improvement of the soil.

In presenting this subject, many things are to be considered. The first in importance is a good foundation. A red clay foundation is considered the best. This being obtained, good teams, ploughs and other implements of husbandry must be had. Land may be much improved by good ploughing. Deep ploughing is all important, mixing a portion of the clay with the mould, thereby increasing the depth of soil and its fertility. This may be carried too far upon thin soil. The depth of ploughing should be regularly increased, and not much clay turned up at one time. Very much depends on the proper draining of land. Nothing is more ruinous to the productiveness of land, than suffering the water to lie on it and causing it to become sobbed. The abominable three-shift system, so well calculated to impoverish and destroy the soil, is now growing into disuse with intelligent and practical farmers, experience having proven that it was ruinous both to the owner and to the soil. This practice may answer on James River bottom, but I doubt if there will not be a regular falling off in such land and its products. I am not able to speak from experience, and much the larger portion of agriculturists, being owners of high-land farms, my remarks are intended more immediately to apply to such. A number of persons are now practising upon the four-shift system. This is rather better, and in the hands of skilful managers, the soil will receive some improvement. But to this system I have many objections;—I am in favor of the five-field system, and consider it the very best that could be adopted for this section of the country.

In order to improve to advantage, you must have good teams. There is great want of management in this one particular. Let your teams be increased, and the number of laborers may be diminished. There are very few farms that have sufficient teams. From my own observation, combined with practice, I would say, there should be a good horse or mule or a yoke of oxen, to each hand. The five-field system that I am about to recommend, will require this proportion of animal labor in order to operate to advantage. If every farmer now cultivating upon the four-field plan, would divide his farm into five-fields, and adopt the following course of cultivation, I have no doubt his profits would be greatly increased, and that his land would improve much faster.

Take a farm, say 400 acres; lay it off in five fields, of eighty acres each, No. 1, 2, 3, 4, and 5. The number of laborers and teams required on such a farm, will be about twelve hands, seven or eight men, the balance women or boys; eight good horses or mules, and four yoke of oxen. Your farm being divided into five fields, of eighty acres each, commence, say in 1835 in No. 1; manure in this field from 16 to 18 acres for tobacco; the remaining 62 or 64 acres put in corn. Immediately after harvest, and whenever the land is in suitable condition for fallowing, put all your teams to that business, and fallow No. 2 for wheat. In the fall, 1835, sow No. 1 and 2 in wheat. In the spring, 1336, say last of February, or first of March, sow No. 1 and 2 in clover. From the 1st to the 15th April, sow half a bushel of plaster per acre on the young clover just up in No. 1 and 2. This will enable the young clover to stand the drought of summer. One gallon of clover seed per acre is usually sown. In 1836 manure the same quantity in No. 3 for tobacco, and put the balance in corn, fallowing No. 4 for wheat. Fall, 1836, sow No. 3 and 4 in wheat. Spring, 1837, sow clover in No. 3 and 4, and plaster, as in No. 1 and 2. The clover in No. 1 and 2 being now 12 months old, sow the same quantity of plaster as last spring. This year the clover in No. 1 and 2 rises to perfection, till which time, you should graze as little as possible.

Permit me to digress a little, and recommend to every farmer and planter to reduce his stock. Have as little as he can possibly do with. You cannot improve land with an overgrown stock. It is useless to sow clover and plaster; it is throwing money away, if you permit the clover to be grazed off. Make your land rich first, and your stock may be increased, and a profit received from them.

I had proceeded as far as No. 4 in the system I was recommending. In 1837, manure in No. 5 for tobacco, as in No. 1 and 3, and put the remainder in corn. Fallow No. 1 for wheat, being a good clover lay. Seed No. 5 and 1 in wheat in the fall, 1837. Spring, 1838, sow clover and plaster on No. 5 also, half bushel of plaster per acre on No. 3 and 4. It will be unnecessary to sow clover seed this spring on No. 1; it being a clover fallow, enough will have been turned in to insure a crop; and having come under to No. 1, clover fallow, you will now begin to see the benefits of this system. You will find that the additional crop from No. 1, will pay a good per cent. upon the expenditure—indeed you will discover that it was money lent at usury; and discard at once and forever the idea and excuse used by so many persons, that you are not able to sow clover and plaster. You will then find, as I have done, that your interest will not permit you to dispense with its use. You will perceive, that by practising upon this system, you will have three-fifths of your land in cultivation every year; one-fifth in corn and tobacco, two-fifths in wheat, and the remaining two-fifths in clover, rising to maturity. You will therefore have three crops from each field in five years—one of corn and two of wheat. You will have each year one hundred and sixty acres in wheat, and eighty acres in corn and tobacco, say 16 acres in tobacco, and 64 acres in corn, the balance, 160 acres, in clover—never raising tobacco two years in succession upon the same land.

If you should farm it entirely, a farm of the size before stated would not require as many laborers by one-third; in every other respect, the course would be the same, simply dispensing with the tobacco crop. Compare this system with the four-field system: farm 400 acres, four fields, 100 acres each, No. 1, 2, 3 and 4. On this plan you would be unable to fallow for wheat; demonstrated thus: 1835; No. 1 in wheat, fallow No. 2; fall, 1835, sow No. 1 and 2 in wheat; spring, 1836, sow 1 and 2 in clover, corn in No. 3; fallow No. 4; seed No. 3 and 4 in wheat. In 1837 you would have to plough under young clover in No. 1 for corn; consequently the land would receive no benefit, the clover not having risen or come to maturity; and so it would be every year afterwards. Under this plan your profits would be less, and the land receive but little, if any improvement. If you grazed at all, you would destroy all your clover. Your crops of wheat would be greatly diminished, having under this plan only 100 acres in wheat,

and that corn land, or corn and tobacco land. Under the other system, you would have 160 acres in wheat; 80 clover fallow; 16 or 18 tobacco land, and the balance corn land. Clover fallow will double corn land upon an average in wheat. The crop of wheat from the 160 acres will more than double that from the 100 acres. Take a tract of land of 800 acres; divide it into two tracts of 400 acres each; place two farmers equal in management, one on each, one pursuing the four-field system, the other the five, and without any hesitation I would say, that in less than ten years the profits of the five-field farmer would exceed that of the other at least one-third—their capital being equal when they commenced. The great secret as to the best mode of improving lands, although an extensive subject, may be expressed in a very few words. First lay off your land into a sufficient number of fields, use clover and plaster freely, plough well graze but little, raise as much manure as possible, and apply that judiciously.

Pursue this course and your land will be improved, and your purse be filled. The cost of this system is as follows: one gallon of clover seed, average cost 75 cents; one bushel of plaster, half bushel first and half bushel second spring after seeding clover, average cost a little less than 50 cents, say 50 cents, added to cost of clover, make $1 25 per acre—the whole expense. Such land as had usually brought eight bushels to the acre, would bring an increased crop of from four to six bushels, from the first clover fallow, and a regular increase afterwards—the system being kept up. Here then the expense is $1 25 per acre; increased crop from four to six bushels of wheat per acre, say four bushels at $1 per bushel, is $4; take off the expense, $1 25, and you have a nett profit of $2 75 per acre, a little upwards of 200 per cent. on the expenditure. This is not at all, your land is in much better condition, being in a rapid state of improvement. You will also have received considerable benefit from grazing and clover hay.

Gentlemen, this is no theory, no book knowledge: make the experiment, and give it a fair trial, and you will more than realize all that I have stated. There are many other points that deserve consideration—the best way of preparing land for the reception of seed, management of stock, &c., but I fear I have already descended too much into detail for an agricultural address, and that it has more length than interest—but the great interest I feel in the cause, is my apology.

From the Newbern Spectator.

A PROPOSITION TO EXCLUDE ANONYMOUS WRITERS.

[It is a rare occurrence for us to quote any remarks of our editorial brethren of the *political* press, unless relating more to our department than to theirs. The following proposition, however, though designed for political newspapers, if adopted, would have effects of uncalculable amount and value on the morals and the interest of our country at large.]

"The editor of the *Newbern Spectator* (says the People's Press,) proposes that the editors in this state "*close their columns forever against anonymous writers.*" This would prevent the indulgence of a rancorous spirit through the newspapers; and although some disadvantages would attend it, in preventing the modest aspirants for literary fame from making their debut, yet as a whole it would be far preferable to the present system. We say *aye* to the proposition."

We are pleased to see that our proposition meets with favor, and we thank the independent Editor of the "Press" for his support. There can be no more doubt that editors will feel relieved by the adoption of the rule, than that the journals of the state will be rendered more dignified, moral and efficacious. All of them must have felt the disagreeable necessity of offending acquaintances by rejecting communications that had no other ends in view than the gratification of the writers' embittered feelings, and the mortification of those of their opponents; and all of them must sometimes have felt, as we have often done, extremely chagrined to see columns of insipid, ungrammatical, and prosing stuff presented to their readers by anonymous *savans*, which delicacy forbade them to reject, though they well knew its worthlessness. All this "gnashing of teeth" will be avoided by the establishment of the rule which we propose, viz., to admit nothing which is not subscribed with the real name of the author, and only as much of that as we shall deem worthy.

What say ye, Registers, Recorders, Stars, Suns, Watchmen, Examiners, Heralds and Journals? Will you aid in this effort to retrieve the character of the press of the state?

For the Farmers' Register.

RAIL ROADS IN VIRGINIA.

The first rail road undertaken in Virginia, was from the coal mines in Chesterfield to tide-water, opposite Richmond—a distance of twelve miles. On the completion of this, about five years ago, the stock advanced to more than 50 per cent. premium, and a large portion of the capital has been re-funded to the stockholders, exclusive of the payment of interest on the investment.

The second undertaking was on a much more extensive scale, and its success was considered, at the time, very problematical, as it had not the advantage, like its predecessor, of the certain transportation of a vast mineral product, but was dependant on that of agricultural produce of foreign goods in return, and of passengers. This work was the Petersburg and Roanoke Rail Road—61 miles in length. It was steadily persevered in, and struggled through the difficulties attendant on new undertakings, but was completed in about two years at an expense of $600,000—including ample means for transportation, and has divided 10 per cent. annually. The tardy movement of three or four days by wagons, was thus reduced to five hours, and the expense diminished more than one-half. The termination of this road on the Roanoke, is at the village of Blakely, immediately below the falls of the river, and from whence, it is navigable for steam boats to Albemarle Sound. The prospect of success exhibited by this work, caused a rival one to be undertaken, before the former was completed, commencing at Portsmouth and to terminate at Weldon on the Roanoke. This work has been about three years in hand, and is advancing to completion.

A third work, (called the Greensville and Roanoke Rail Road, eighteen miles in length) termi-

nating on the Roanoke, about fifteen miles above, the first, (at a point recently honored with the name of Gaston,) avoiding the great falls of the river between that place and Blakely, and connecting with the Petersburg road near the village of Hick's Ford, is now in active progress, and will be completed during the ensuing year.

From Gaston the line of rail roads can be continued on the great mail route to Raleigh, and thence south, to Columbia, and west, into the interior of North Carolina, if the legislature of that state will foster such undertakings.

Retracing our steps to Petersburg, we find a a rail road about to be constructed from thence to Richmond, 20 miles; of the successful and speedy prosecution of which, there is no doubt.

From Richmond a great work is now in rapid progress, extending north through Fredericksburg to the Potomac 70 miles, and thus completing an entire line from north to south through the state of Virginia. A branch from this road westwardly is projected to Taylorsville and Charlottesville—through a rich and fertile country.

The stocks of the Petersburg, Greensville and Potomac roads all command a premium, and that from Richmond to Petersburg will be readily taken so soon as the charter shall be obtained.

Turning our view west, we find the Winchester and Potomac Rail Road, of about 35 miles nearly completed, and an extension from Winchester to Staunton (say 90 miles,) about to be commenced. A reference to the map will show that these will form an uninterrupted communication from the latter place to Baltimore.

Among the works now contemplated, are a continuation of rail road from the several points of termination already mentioned on the Roanoke, by Milton and Danville to Evansham in Wythe county—thence, as a matter of course, to the line of Tennessee. A rival to this is projected from Lynchburg to Evansham, Abingdon, &c. Both are splendid projects, and either of them would form an extended arm toward a connection with Nashville, Mobile and New Orleans.

Last, but greatest in extent, is the work now commenced by a canal and rail road from Richmond by Lynchburg to the navigable waters of the Kanawha and Ohio—an undertaking, toward which, the commonwealth has engaged to contribute its million, and which, when completed, will be second to none in the union.

R. R.

EXTRACTS OF PRIVATE CORRESPONDENCE.

[Though in this puffing age—when editors of periodicals not only accept and repeat, but beg, buy, exchange, and manufacture the most fulsome and disgusting puffs of their works and of themselves—when the most exorbitant of the trade bring together, and republish regularly, all the puffs that they have procured by these various means—still, as holding in deserved contempt these acts of meanness and fraud, we may need the indulgence and pardon of our readers for exhibiting such extracts as some of the following, however different may be the motives which have actuated their writers, from those who make and publish puffs as a part of the regular pecuniary business of publication. But besides the vast difference of persons, and of motives, there is a general remark applicable to these extracts from the private letters of our correspondents which serves to qualify their expressions, and to excuse their being here introduced. The writers of these pieces (and of many others which we have suppressed, because conveying nothing but mere applause,) seem to *personify* the Farmers' Register, and to address to its editor the testimony of approbation which all its contributors have a right to share, and of which but a small portion belongs to us individually. This general correction, or substitution of names, being understood, it may be permitted to publish expressions of approbation, which, on account of the sources from which some of them proceed, deserve to be highly prized by every contributor who has added something to the reputation and usefulness of the Farmers' Register.]

Halifax, Va.,———

I cannot permit this opportunity to pass without expressing to you the pleasure and profit which I continue to derive from your labors. I was at first fearful that the subject would be exhausted in six or eight months, but it appears to expand in your hands, and I now verily believe, that if you reach the age of four score, and continue diligent, you will hardly be able to correct all the abuses and ignorances which beset the noble science of agriculture. You have called forth a spirit of improvement in the Old Dominion; you have infused life into a dead body, and should you now drop your pen and sleep—you will pardon me for saying, that I know of no man who even then could say, that "*I* have done more service to the state." * * * *

In this section of the state our system of tillage is not quite so barbarous as it once was, but still it is wretched. The spirit of emigration here is entirely at war with the spirit of improvement. Men constantly say, "Why improve? I am going in a short time to the west." Others again, "My land will support me as long as I live, and my children will, as soon as they are of age, *go out.*" Now if men would wish to improve, and would seek for information, there would be some hopes of the country; but when they flatly tell you they care nothing for it—what can be done? Argument and exhortation are thrown away, and one is almost tempted to despair of the Old Dominion. If any thing can be done to dispel this frightful lethargy—you are the man to do it. Go on, sir, and do you at least not despair: for so soon as you give the cry of retreat "*sauve qui peut,*" there will be a general rush to the "land of milk and honey," and your humble servant among the rest. Persuade every body to live in this country, and to make the country worth living in. May you succeed.

—

Westmoreland, Va., ———

I cannot refrain from expressing the great pleasure I have already received from the perusal of the 1st Vol. of your paper, and I feel satisfied if its circulation could be more widely extended in our Northern Neck, that in a few years our section of country would wear a very different aspect, and our lands, instead of being a "drug in the market," would assume a value equal, if not superior, to any in the state. It will no doubt be gratifying to you to learn that since your periodical

found its way into this neighborhood, an interest has been excited on the subject of improving our lands, which is likely to be productive of important results. I know several farmers near me who have had their farms divided for years into two fields, and until the appearance of your paper, had perhaps never thought of improvement, beyond the covering of two three acres with farm-pen manure, have now divided their farms into four fields, and have commenced using lime and clover to a considerable extent. Others again who are not prepared to go fully into the foregoing system, are making experiments in the small way, by cutting off lots, making standing pastures, hauling out sea ore (which had been neglected for years,) and the like. In short, sir, I think we are on the very verge of a new era in agriculture; and, if I am not greatly mistaken, the face of our country in ten years will wear almost as different an aspect, as did the village of his nativity to Rip Van Winkle after his sleep of twenty years. * * *

—

King & Queen, Va., March 26th, 1835.

I consider the Farmers' Register a most valuable work, and particularly the three or four first numbers, which induced me to divide my farm into four shifts, under which system it is improving most rapidly; and whenever I can get clover to stick, I shall think the work done. However, peas are not much inferior to clover, and will grow on almost any land. When "laying by" my corn, which I did with cultivators, I sowed peas on several acres: and when they were beginning to bear, I turned them in with a double plough—and I am sure the wheat would not have looked better had I used the best manure.

—

Pendleton, S. C., Aug. 17, 1835.

I am in hopes the permanent success of your paper is ensured by a liberal patronage. It should be in the hands of every planter who wishes to keep up with the rapid improvements now making in agriculture, or profit by the experience of those who have wasted much time, experimentally, in obtaining their results. But it is a striking fact, that those who constitute the largest, as well as the most solid portion of society, should be so indifferent to their interests as to exclude periodicals, whose pages are crowded with matter calculated to cast a flood of light upon their pursuits, whilst their names contribute to swell out the list of the numerous journals, self-styled "Literary Emporiums," but whose columns are the receptacles of subjects "light as air."

—

Caroline, Sept. 16th, 1835.

The Farmers' Register has rendered, and is doubtless rendering to the farming interest, a most essential service. Your treatise on calcareous manures, followed by the Register, has (I have sometimes thought) brought about a new era in agriculture—at least in Eastern Virginia. Farmers are rapidly imbibing the important doctrine that a *considerable outlay* of capital in the improvement of their lands is not at variance with immediate profit in husbandry—a principle in husbandry, which if established and fixed in the agricultural mind as correct, is admirably calculated to assist in the resuscitation of old Virginia. For could the people be brought to believe in the practicability of a general improvement of their farms without a too great annihilation of profit, a degree of contentment (I imagine) would thereby be attained, which would greatly check the present fearful drain of population and capital from our state. Indeed, I am induced to look upon it, as calculated to prove, eventually, one of the most salutary and effectual checks to emigration. May your valuable labors in this, and many other respects, be crowned with great success.

Much has been said in favor of both the three and four-field systems, without enabling the farming community to arrive at a definite conclusion touching the matter. From all that I have seen on the subject, and reflection bestowed, I am induced to think the three-field system suits all such sections peculiarly well suited to the production of corn, and the four-field, those which suit wheat; for when the unsuitableness of lands to the wheat crop is considered, in connexion with the great uncertainty of that crop, farmers in corn sections are loth to depart from the old three-field system.

—

Pendleton, (S. C.,) Oct. 8, 1835.

Absence from home and my numerous engagements, prevented me from perusing the supplement to the Register, and the No. that accompanied it, till within the last few days.

I read them both with pleasure and instruction, particularly the former. Your remarks and experiments on calcareous manures are highly interesting; and as a southern planter, I tender you my thanks for the benefit that you have already conferred on lower Virginia, and which I doubt not, will ultimately rescue from poverty and wretchedness, not only that portion of Virginia, but all of the corresponding portions of the southern states.

In reflecting on our future prospects, nothing has caused such melancholy feelings, as the steady progress to sterility, which has followed our southern agriculture from the first settlement of the country. It must be arrested, or the doom of the southern race will be the most wretched that can be conceived. A universal debasement, morally and intellectually, must follow. To arrest such calamity, you had the honor of making a great, and successful effort—and that on the very spot where the evil first commenced, and which had produced its worst effects. I trust your example will induce others in different portions of the south to follow in the same patriotic course, till the evil shall be entirely arrested. It ought to be a principle of morals and patriotism, as well as of individual economy with us, that no gain is legitimate that does not leave the land as productive as it was before it was taken.

—

Prince George, Nov. 17, 1835.

I should be glad to see, from some intelligent correspondent, a communication on the Hessian fly, with a *very* minute account of its habits. There are few more interesting subjects of investigation; and a patient and scientific observer might produce results of great consequence in a national, as well as individual point of view. I should also be pleased to get some information relative to the *vi-*

rus of the St. John's wort, and the best methods of relieving animals that have been affected by it. Its specific action on the white spots [of cattle] only, or at least mainly, is somewhat remarkable. I have this year heard much of the ravages of the fly—so called *par eminence*—and have in some measure experienced them. I am now re-sowing some of the places that were most injured.

An acquaintance has lately assured me that his sales last year, from a farm, which originally cost him but $3,500, amounted to $3,600! How many emigrants would this hurry off, if told of a *new country*. You will perhaps guess that I refer to Mr. ————.

From the Cultivator.

INFLUENCE OF THE STOCK ON GRAFTED FRUITS.

On a recent visit to a friend in Hartford, Conn. we had occular demonstration of *the influence of the stock upon the fruit*. Our friend had in his garden a pear tree bearing large summer fruit, which ere it was ripe became rotten at the core. The fruit being consequently worthless, he engrafted the St. Germain pear upon several of the side shoots, and the Vergalue upon the top. The effect has been, to enlarge the fruits last grafted, and to accellerate their ripening at least a month. The St. Germain, of which we took several, are of double the size of those grown on the tree from which the grafts were taken; the Vergalue is somewhat increased in size, though deteriorated in quality, and one of the fruits which we ate showed a partial rottenness at the core. The effect of growing butter, or melting pears, on the quince, a practice general in France, is to impart more solidity to the flesh. These facts may become important, as they seem to suggest a new means of crossing fruits, by which the maturity of those that ripen too late for a northern climate may be accellerated; and those which ripen too early for winter use may be retarded in their maturity. The grape affords a good subject for experiment; and the Isabella, Catawba and Blands, may thus be brought to ripen their crops with more certainty and in greater perfection among us.

[This report was prepared for our last No., but having been delayed on its passage, did not arrive until the last sheet was printing off. As the contents apply to the commercial transactions of the whole preceding year, the value of the report is not materially impaired by the delay of publication.]

For the Farmers' Register.

COMMERCIAL REPORT FOR OCTOBER.

The inspections of tobacco in Virginia, the exports of that article, and the stocks on hand at the expiration of each year, ascertained to 1st October, were as follows:

Year.	Inspections.	Exports.	Stocks.
1832	36,446	26,614	11,950 hhds.
1833	34,250	19,783	12,350
1834	35,600	25,300	10,600
1835	47,000	25,919	15,600

The exports of the year ending 1st instant, may be classed thus—

To London	6,854 hhds.
Liverpool	6,924
Bristol	1,290
Glasgow	674
Leith	283
New Castle	192
Havre	3,689
Bordeaux	300
Marseilles	150
Gibraltar	250
Antwerp	400
Amsterdam	30
Rotterdam	758
Bremen	1,077
Cowes, &c. for orders	2,943
West Indies	111

About 16,000 hhds. were manufactured in the state or shipped coast-wise.

Although the inspection was so large, the demand has been sufficient to meet the increase, and prices are well supported. Scarcely any of the old crop can be purcased at less than $6; and all prices are paid up to $12½ per 100 lbs. according to quality.

The apprehension of frost at the close of last month, and its actual prevalence in the early part of this, caused the planters, generally, to cut their tobacco in a green state, and of that which was left in the fields, the greatest portion was killed. So large a crop had, however, been planted, that an average product may be expected—though the quality will prove very inferior. The crop in Kentucky and Tennessee is reported to be larger than in any former year—that of Maryland very small.

The quantity of cotton received in Virginia during the year ending 1st instant, was 33,000 bales, being 11,000 less than in 1834. The crop of the United States for the last ten years, has been—

1824	560,000 bales	1829	977,000 bales
1825	710,000	1830	1,039,000
1826	937,000	1831	987,000
1827	712,000	1832	1,070,000
1828	858,000	1833	1,205,000
	The crop of	1834	1,254,000 was

thus disposed of

Exported to Great Britain	722,700
France	252,400
Other ports	48,390
Manufactured in the U. States	217,000

The quantity received in the different markets during the last three years is stated thus—

	1833	1834	1835
New Orleans	403,500	454,700	511,100
Florida	23,600	36,700	52,100
Mobile	130,000	150,000	198,000
Georgia	271,000	258,600	222,700
South Carolina	182,000	227,300	203,200
North Carolina	30,300	33,200	34,400
Virginia	31,000	44,700	33,200

The great annual increase in the culture of this article baffles all calculation as to injury sustained by the crop. The last, which was supposed to be smaller than the previous one, from the unfavorable season in 1834, proves to be 50,000 bales more; and the crop of the present year is estimated at 1,400,000 bales.

It is unreasonable to expect that high prices can be supported under such an increase of cultivation; and the markets in Europe and this country have been gradually declining for some time. New cotton now commands 15 cents, but it is expected to fall as the season advances. The quality is said to be unusually good. In Virginia the crop was diminished by frost, also in North Carolina—but not south of that.

As the season advances, it becomes more manifest that the wheat crop in Virginia and North Carolina was very short. The mills have not ground half their usual quantity—are without any stocks of wheat, and will be compelled to remain idle a great part of the season. Red wheat sells at $1 30, and white at $1 35 cents. Country flour $6 25. City Mills $7. There was exported from Richmond, direct to Brazil during the past season, 62,000 barrels flour. Exchange on London 9¼ premium.

Oct. 28. X.

COMMERCIAL REPORT FOR NOVEMBER.

Your correspondent regrets that he should have caused any disappointment to you last month, by the delay of his communication. The statistical details it contained may be useful to some persons, for future reference, and if you think proper to publish them at this late period, the present report need but notice the slight variations which have since occurred.

A momentary excitement in the wheat market, which arose from no other cause than competition among the millers, advanced the price of wheat for a few days to $1.40, and even higher. The unprofitable contest soon, however, subsided, and the price receded to $1.30 to $1.33 cents for red, which is now the quotation. As no other than City Mills flour commands more than $6.50 per barrel, the millers can make but slender profits, if any. It is remarkable that in no other markets in the United States, has the price of wheat been so high this season as in Richmond and Petersburg. This may be ascribed to the great deficiency of the crop. Several cargoes of wheat have been imported into this country from Europe, and some flour which had long remained unsaleable in England has been returned to the United States.

The receipts of cotton in the Virginia markets since the first of October, have been very small—about 5000 bales in Petersburg, and less than 1000 in other places. It has all met a ready sale, and at advanced prices, while in all the northern and southern ports there was a decline. From 15 cents, which was current a few weeks ago, the price has gradually risen in Petersburg to 15⅝ cents for good new cotton. In New York during the same time it has declined 1½ to 2 cents. The reported injury by frost in Virginia, and a large part of North Carolina is confirmed, reducing the produce of the portion of country where it prevailed, to about the same as last year—if not less. In north Alabama and part of Tennessee, the diminution is said to be one-half. In other portions of the country it was more or less felt, but still the increased cultivation in the west is such as to induce a belief that the crop of the United States will not fall short of 1,350,000, and may reach 1,400,000 bales. Should this estimate be realized, the inference is that the prices must decline.

Since the frost in the early part of October, the temperature has been that of summer, with the exception of one or two days, until the present time, and but for that early frost, the crops of cotton and tobacco would probably have been so large as to overstock all markets.

Tobacco continues in good demand at high prices. Of the old crop about 1500 hogsheads, or less, remain for sale, and several thousand hogsheads are held by shippers, or in course of shipment. Old may be quoted $6.50 to $12. Of the new, the receipts have been confined to the lowest quality, (lugs, primings, and partly frost bitten,) which sells from $5 to $6.50, and to loose tobacco, not perfectly cured, embracing crops round at $7 to $8. The early cuttings, previous to the frost, will furnish a portion of good and fine quality, but the great mass of the crop it is thought will prove very inferior.

It is stated that the French government intends to restrict the cultivation of tobacco in that country to a smaller quantity than heretofore, if not to prohibit it entirely, and also to change its system of obtaining supplies of American tobacco. That it will make contracts for future delivery to correspond with the samples exhibited, not confining its purchases to fine quality, leaving it open to all persons to make tenders. Should these statements be confirmed, the interest of the tobacco growers in the United States will be promoted, but it would be more desirable to have the trade in this article unshackled, as it is in every other.

Stocks generally have declined in the northern cities, but prices there being generally governed by gambling speculations, there is no steadiness in them. The stocks of the Virginia banks vary but little—Virginia Bank 113½ to 114—Farmer's Bank, a trifle lower. Petersburg Rail Road shares have been sold at $120, including the six months' dividend of 5 per cent., payable the first of December—Richmond and Potomac Rail Road $10 premium—Greensville and Roanoke $5 to $7 premium. Exchange on England 9½.

X.

November 23.

THE BRITISH FARMER'S MAGAZINE AND THE FARMERS' REGISTER.

The British Farmers' Magazine for July contains nearly thirty two pages of matter extracted from the Farmers' Register and from the Essay on Calcareous Manures (1st Ed.) This circumstance is the more remarkable, as it is not the practice of this, or other British periodicals, to present other than original pieces, except such short extracts as are embraced in their reviews of new publications. Even to these, but little space is allowed in agricultural journals, there being rarely more than a page or two given to the review of any one work. In the two years that we have received this journal, it is not remembered that there has been a single selected article published. The present departure from previous usage, in this respect, and the fact of the extracts being so very copious, present an unusual, as well as complimentary notice of the pieces so extracted. Still, there is something to be complained of in the manner in which these articles are presented to European readers. For the first one only, "*On the influence of parentage on offspring, in breeding*

animals,"* is credit given to the Farmers' Register, which is named as the source, and as "a highly respectable agricultural periodical, published at Richmond, U. S." By the way, our correspondent, to whom this journal was indebted for that communication, may well consider it a compliment to his theoretical opinions on this subject, that they should have been so republished in this British work, as its conductor, the Rev. Henry Berry, is one of the most judicious breeders in England, and esteemed as the highest authority on improved live stock, and all matters connected with their breeding.

The next article republished from the Farmers' Register, is the translation made for this journal, from the *Journal d'Agricultural des Bays-Bas*, of Dr. Bronn's essay on "*The influence of the origin of seeds on the quantity and quality of crops.*" We have, by our comments, at several times, endeavored to attract more attention to this interesting and valuable piece, and thought it strange that it should have been so little noticed; and still more so, that the British public should now be indebted for it to our translation, instead of to the original article, as it appeared in the Belgium journal. The presenting the first *translation* of a foreign article is certainly a merit in a journal very inferior to being the source of one entirely original, of equal value: still the service is worth some acknowledgement —and not the slightest has the British journal made to our's, for this translation.

From the form in which is presented the portion of the Essay on Calcareous Manures, it may be considered as the commencement of the publication of an entire English edition. The extract embraces the whole of the first five chapters, excepting the 2nd, ("On the soils and state of agriculture of the tide-water district of Virginia," which is omitted,) and the closing words indicate that in the next No. the work was to be continued. But there is not the least editorial note, nor even the mechanical indication made by a change of type, to show that the entire article is not there original, and appearing for the first time. It will scarcely be deemed a contradiction to this assertion, that the author's name is given, followed by the letters U. S. which probably serve as little to point out locality to an English reader, as the letter N. S. W. or G. B. would to us that an author was an inhabitant of New South Wales, or of Great Britain. It is true (notwithstanding the omission of all credit to the original source, and of the preface, and of the chapter which applies more particularly to our localities,) that a diligent reader would gather from the general purport, the country whence the work was derived, and to which it was more especially designed to apply. But probably few would be induced to give so much attention to what appeared under so deceptive and uninviting a guise.

The mechanical arrangement of this No. of the British journal, would furnish still stronger ground for our charge. In the Table of Contents (printed conspicuously on the first page,) all the three articles above named, are classed under the head of "Branch 1. *Original communications, &c.*" and neither of them even stands in the subdivision of that Branch, "Notice of New Publications." The "Branch II. *Agricultural Intelligence*," is devoted to subjects of quite a different character—and *selections* of entire articles, are not named, as a separate branch, and do not come within the usual range of the publication. This incorrect arrangement, however, might have been caused by the printer's mistake—and would not have been complained of, if the borrowed articles had been properly acknowledged elsewhere.

But putting aside all personal considerations, it is a subject of congratulation that this commencement is made by a British journal of the use of American agricultural opinions. In agricultural science and practice, the best informed communities, as well as individuals, may often learn something of value from the far more ignorant—and the latter may gain still more by having their opinions and and practices judged, and tested by the more enlightened. There is no department of science, or art, in which free and reciprocal communication of opinion would be more serviceable than in agriculture—and none on which there has heretofore been so little. European agriculturists, vain of their acknowledged superiority, perhaps hold all American agriculture in contempt, and as unworthy of other notice: and our farmers generally, encased in the still more impenetrable armor of contented ignorance, consider all English farming as inapplicable to us, and that nothing profitable can be learned from its study. Either country would certainly be wrong to copy fully the practices of the other in any one respect —yet either may learn much, and profit much, by knowing, comparing, and judiciously combining, some of the practices of both. Through this journal no pains have been spared to spread before our readers the best selection of recent European agricultural information—and not without some (already known) good fruits to our country; and the particular circumstances which have called forth these remarks, induce the belief that similar means of deriving information will be so made use of by our European fellow laborers, that both countries will derive from the course redoubled benefit.

SEASON AND CROPS.

Since the latter part of October, when our last observations on the season were written, the weather has been very generally and unusually warm—a few days of that time only, previous to the 24th of November, having been cold enough to be suitable to this region. Much the greater part of November has indeed been at least as warm as is usually the corresponding part of October. Of course, (and in direct contradiction to our former anticipation,) the Hessian fly has not only been destructive, to the wheat but to an alarming extent. Some land has been ploughed up and sown again.

Many farmers have already discovered that their corn was too little cured to be housed, when it was done at the usual time—and have had to throw out of their cribs the greater part, to stop the progress of mouldiness. All will need to be attentive to this important matter. This evil has not been experienced before, since the remarkable year 1816. No better proof could be furnished of the predominance, through the past summer, of unusual cold and moisture.

---

* *See page* 193, *Vol. I. Farm. Reg.*